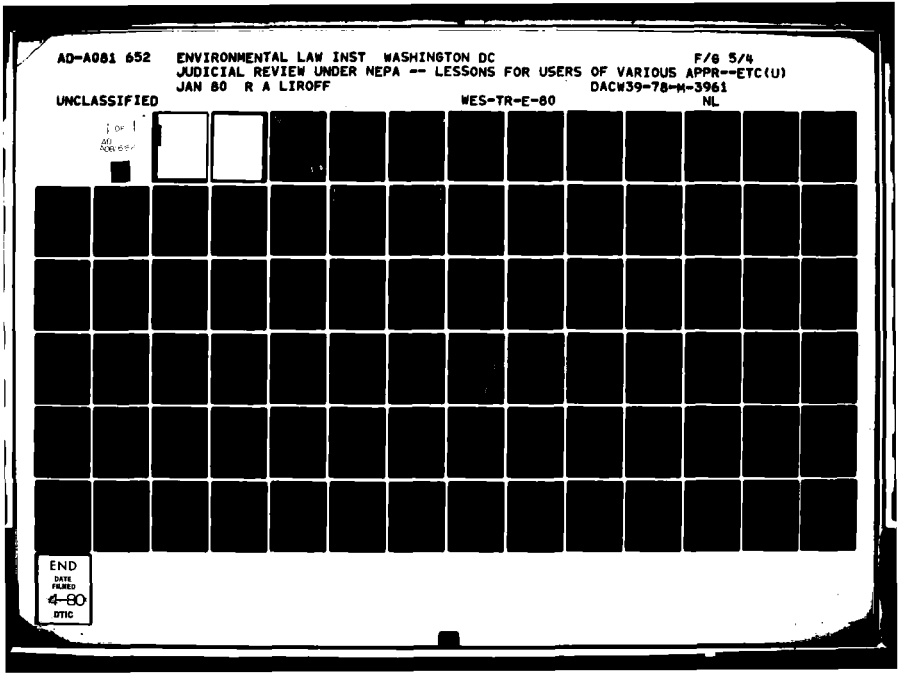
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1. This report, "Judicial Review Under NEPA--Lessons for Users of Various Approaches to Environmental Impact Assessment," was prepared on a contract basis by Richard A. Liroff while with the Environmental Law Institute (Dr. Liroff is now with the Conservation Foundation). The report was prepared as part of Work Unit 31607 (IVA), "Alternative Techniques for Environmental Analysis," of the Corps' Environmental and Water Quality Operational Studies (EWQOS) Program. The objective of Work Unit 31607 is the identification of methodologies and techniques for environmental analysis to address the environmental quality objective in multiobjective planning.

2. This work involved a comprehensive review of litigation under the National Environmental Policy Act (NEPA) to identify judicial decisions and interpretations which have relevance to preparers of environmental impact statements. Of particular interest was litigation pertaining to: the composition and operation of an interdisciplinary team preparing an impact statement; impact assessment approaches, especially numerically based methodologies; and documentation of the planning and decision-making processes. Particular attention was paid to judicial review of projects and planning activities of Federal water resources development agencies and natural resource management agencies. This report summarizes the results of the comprehensive review and pertinent points gleaned from them.

NELSON P. CONOVER
Colonel, Corps of Engineers
Commander and Director

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A review of judicial guidance based on the National Environmental Policy Act (NEPA) was conducted relative to several key aspects of the use of various approaches to environmental impact assessment. Specifically, judicial guidance was summarized on (a) treatment of conflicting professional opinions in environmental impact statements, (b) documentation of the planning and decisionmaking process, (c) quantification of environmental impacts, (d) consideration of alternatives in environmental impact statements, and

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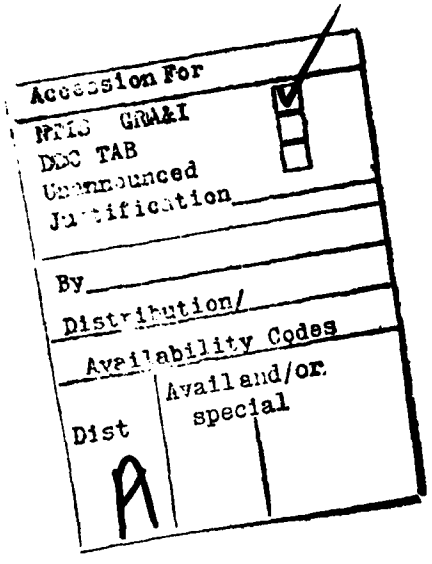
20. ABSTRACT (Continued).

(e) the composition and operation of interdisciplinary teams conducting environmental assessments.

In addition to discussions of the boundaries of judicial review relative to each of the five specific topics, NEPA itself is discussed, and recommendations for users of various environmental analysis approaches are made.



PREFACE

The work described in this report was performed under Contract No. DACW39-78-M-3961, dated June 1978, between the U. S. Army Engineer Waterways Experiment Station (WES) and the Environmental Law Institute. The research was sponsored by the Office, Chief of Engineers, U. S. Army, Washington, D. C., and directed by the Environmental Laboratory (EL), WES.

The report was prepared by Dr. Richard A. Liroff while he was Project Associate at the Environmental Law Institute; Dr. Liroff is now associated with the Conservation Foundation, Washington, D. C. The report follows specific guidelines established by WES. The contractor was given the charge to: (1) prepare a comprehensive review of National Environmental Policy Act (NEPA) litigation pertaining to (a) the composition and operation of an interdisciplinary team preparing an impact statement, (b) impact assessment approaches, particularly numerically based methodologies, and (c) documentation of the planning and decision-making processes. Particular attention will be paid to judicial review of water resource development projects of the Corps of Engineers, Bureau of Reclamation, Tennessee Valley Authority, and the Soil Conservation Service, and to opinions reviewing the planning activities of such Federal natural resource management agencies as the Bureau of Land Management and the Forest Service, and (2) prepare a report documenting the results of the comprehensive review, clearly indicating the cases reviewed and the pertinent points gleaned from them.

The contract was managed by Ms. Sue E. Richardson, Sociologist, Environmental Resources Division (ERD), EL. The study was under the general supervision of Dr. Conrad J. Kirby, Chief, ERD, and Dr. John Harrison, Chief, EL.

The Commander and Director of WES was COL J. L. Cannon, CE. Technical Director was Mr. F. R. Brown.

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JUDICIAL REVIEW UNDER NEPA--LESSONS FOR USERS OF VARIOUS APPROACHES TO ENVIRONMENTAL IMPACT ASSESSMENT

INTRODUCTION

Various approaches have been developed to the interdisciplinary assessment of the impacts of alternative proposals as mandated by the National Environmental Policy Act (NEPA),[1/*] by Executive Order 11514,[2/] by Section 122 of the River and Harbor and Flood Control Act of 1970,[3/] by the Principles and Standards for Planning Water and Related Land Resources developed by the Water Resources Council,[4/] and by guidelines and regulations of the Council on Environmental Quality[5/] (CEQ) and the Corps of Engineers.[6/]

The Corps wishes to assure that any suggested procedures are designed in accordance with the requirements of NEPA as interpreted by the courts. It has asked the Environmental Law Institute to summarize judicial guidance on

1) treatment of conflicting professional opinions in environmental impact statements,
2) documentation of the planning and decisionmaking process,
3) quantification of environmental impacts,
4) consideration of alternatives in environmental impact statements, and
5) the composition and operation of interdisciplinary teams conducting environmental assessments.

The following summary draws principally on NEPA-based judicial reviews of the water resource management activities of the Corps, the Tennessee Valley Authority, the Soil Conservation Service, and the Bureau of Reclamation.[7/] It also is based on judicial reviews of actions taken by the Bureau of Land Management and the Forest Service.[8/]

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* All footnotes follow the main text.

The latter two agencies engage in comprehensive planning for management of federal lands. This report also incorporates judicial opinions pertaining to other agencies, and academic analyses of the Corps' implementation of NEPA.[9/]

NEPA

Summary of Key Statutory Provisions

NEPA was signed into law on January 1, 1970. Section 101 of the statute establishes a national environmental policy and calls upon all agencies of the federal government "to use all practicable means, consistent with other essential considerations of national policy" to achieve a host of national environmental goals.[10/] The substantive objectives of section 101 are to be achieved in part through compliance with the procedural requirements of section 102 of the statute. Section 102(2) (A) requires agencies to "utilize a systematic, interdisciplinary approach" to assure the "integrated use" of natural and social sciences and environmental design arts in agency planning affecting the environment. Section 102(2) (B) requires agencies to identify and develop methods and procedures, in consultation with CEQ, to "insure that presently unquantified environmental amenities and values may be given appropriate consideration in decisionmaking along with economic and technical considerations." Section 102(2) (C) contains the statute's well-known requirement for preparation of environmental impact statements for all major federal actions significantly affecting the quality of the human environment. Section 102(2) (E) requires agencies "...to study, develop and describe appropriate alternatives to recommended courses of action in any proposal [involving] unresolved conflicts concerning alternative uses of available resources." Sections 102(D) and 102(F-I) impose still further obligations.

Congressional Intent

NEPA was directed primarily at those federal agencies whose past lack of concern for environmental matters had produced a series of undesirable environmental consequences and a host of environmental

controversies. NEPA's congressional sponsors believed it important to give all federal agencies an environmental mandate and to provide an "action forcing" means for its fulfillment, because many past environmental controversies had "been caused by the failure to consider all relevant points of view and all relevant values in the planning and conduct of Federal activities."[11/] NEPA was intended to force the agencies "to become environment conscious, to bring pressure upon them to respond to the needs of environmental quality, ...and to reorient them toward a consciousness of and sensitivity to the environment."[12/]

NEPA insists that agencies' decisions always incorporate an identification and evaluation of environmental impacts. The function of the action-forcing impact statement is to lay bare the values, assumptions, and calculations underlying processes of agency choice, the presumption being that if particular environmental costs are neglected or undervalued, increased public participation and interagency coordination will ensure their full and fair evaluation. With many reviewers of varied background evaluating an action, all its environmental ramifications should be made clear. Agencies will reduce the adverse impacts of their actions, hopefully, as their own environmental sensitivities are enhanced and as they try to avoid environmentally based criticisms of their proposed actions. In short, the environmental impact statement is the means to more environmentally sensitive decisionmaking.

THE BOUNDARIES OF JUDICIAL REVIEW

NEPA is a brief statute applying to a wide range of actions conducted, supported, and licensed by federal agencies. The period of adjustment to the statute has been long and quite difficult. During this time, NEPA's requirements have been elaborated in administrative and judicial pronouncements. Recalcitrant agencies have had begrudging compliance chastized. Well-meaning agencies have had difficulty applying the statute's requirements to the particular circumstances of their decisionmaking process.[13/]

Obligations imposed by NEPA have been elaborated upon in hundreds

of pages of agency regulations, have been reviewed in hundreds of judicial opinions, and have been commented upon in all too many law journal articles. The reader interested in a complete review of judicial interpretations of NEPA can peruse several book-length treatments of issues arising under the law.[14] Only an abbreviated summary is offered in this report.

NEPA is neither a paper tiger nor a strait jacket.[15] The courts have insisted on rigorous compliance and have held that considerations of cost and delay are not acceptable excuses for noncompliance.[16] Judges generally have had little patience with pro forma compliance and with blatant efforts to undercut the law. But there also is considerable flexibility within the law for those officials making a good faith effort to comply with it. Judges have foresworn the draconian solution of injunctive relief when agency officials have made a genuine compliance effort.[17] Judges have also been accommodating when agencies have admitted deficiencies and have offered to comply with the law in timely fashion and with due public participation.[18] To be sure, individual cases may be cited wherein the courts have either excused what may be pro forma compliance, or have enjoined agency action following well-meaning agency efforts to comply. But by now a sufficient body of NEPA jurisprudence has emerged applying a rule of reason to the interpretation of NEPA's requirements so that good faith efforts to implement the statute should pass judicial muster while deliberate efforts to avoid it will be subjected to judicial sanctions.

Judicial attention has focused principally on implementation of the procedural requirements of section 102. Although environmentalists have attempted to gain judicial reviews of the substantive merits of agency decisions, only a few courts have been willing to provide such reviews.[19] In conducting substantive reviews, courts may engage in substantial inquiry to establish whether an agency decision has been arbitrary and capricious. The inquiry can be searching, to ensure that agencies have taken a hard look at the environmental impact of their actions.[20] However, no court is empowered to substitute its judgment for that of an agency.[21] In practice, some courts have conducted

searching substantive reviews in the guise of procedural reviews,[22] while others seemingly engaged in substantive reviews have not really taken a hard look at the agency actions involved.[23] In some cases, judges have expressed clearly their concern about the adverse consequences of a pending agency action, but have indicated at the same time their unwillingness to substitute their balancing of the factors involved in the decision for that balance reached by the agency.[24] In other cases, district court judges have found reasons to enjoin agency action, only to have their decisions reversed on appeal on the grounds they substituted their judgments for those of the agencies.[25]

Impact Statement
Purpose and Adequacy

Much of the most-cited judicial language pertaining to NEPA's requirements is found in decisions reviewing compliance with NEPA by water resource development agencies. In litigation over the Corps' Gillham Dam, the district court proclaimed that "at the very least, NEPA is an environmental full disclosure law."[26] At a minimum, the court continued, the statement should contain such information as will "alert" the President, the Congress, CEQ, and the public as to the environmental consequences of proposed agency action.[27] In a later decision in this case, the district court declared that NEPA established certain requirements which, if followed, "will insure that the decision maker is fully aware of all the pertinent facts, problems and opinions with respect to the environmental impact of the proposed project."[28] Similar views were expressed by the district court in the Tellico Dam case. The court declared that the purpose of a detailed statement is both to aid the agency's decisionmaking process and to advise the public of the environmental consequences of the proposed action. "[I]t allows those removed from the decisionmaking process to evaluate and balance the factors on their own."[29]

The importance of opening up the decisionmaking process to others was reiterated by the 8th Circuit in its decision involving the Corps' channelization of the Cache River basin. "[T]he complete formal impact study represents an accessible means for opening up the agency

decisionmaking process and subjecting it to critical evaluation by those outside the agency, including the public."[30/] The complete statement "must contain more than a catalog of environmental facts."[31/] The agency must "explicate fully its course of inquiry, its analysis, and its reasoning."[32/] If an impact statement is "too vague, too general and too conclusionary," it cannot "form a basis for responsible evaluation and criticism."[33/]

The courts usually apply a rule of reason in discussing the general content requirements of the environmental impact statement (EIS). The district court in the Tennessee-Tombigbee Waterway case held that the EIS must "thoroughly discuss the significant aspects of the probable environmental impact of the proposed agency action."[34/] By definition, this means "insignificant matters, ...such as those without import, or remote effects, such as mere possibilities unlikely to occur as a result of the proposed activity," need not be discussed.[35/] The district court's test has been widely adopted in the form in which it was reiterated by the 9th Circuit during review of the Teton Dam: "A reasonably thorough discussion of the significant aspects of the probable environmental consequences is all that is required by an EIS."[36/]

Perfection is not demanded of an impact statement. As the 6th Circuit stated in the Tellico Dam case, "NEPA, although rigorous in its requirements, does not require perfection, nor the impossible. [P]racticability and reasonableness...are to be taken into account along with the broad purposes of the Act...."[37/] The court stated, "The [Environmental Defense Fund's] specific objections...to the final statement appear to us to be overly technical and hypercritical."[38/] This language dismissing the environmentalists' criticisms has been repeated in several other cases involving water resource development projects. In the Gillham Dam case, the district court expressed doubt that any agency, no matter how objective, sincere, well staffed, and well financed, could develop a perfect EIS; evaluations by experts were "almost certain to reveal inadequacies or deficiencies."[39/] The court added that "[I]t is not necessary to dot all the I's and cross all the T's...."[40/] In a related vein, the district court in the

Tennessee-Tombigbee Waterway case noted that the requirement of agency compliance with NEPA "to the fullest extent possible" does not require perfection:

> "If perfection were the standard, compliance would necessitate the accumulation of the sum total of scientific knowledge of the environmental elements affected by a proposal. [T]he phrase...clearly imposes a standard...requiring nothing less than comprehensive and objective treatment by the responsible agency. [C]onsideration of environmental matters that is merely partial or performed in a superficial manner does not satisfy the...standard."41/

The 5th Circuit, upholding the district court's Tennessee-Tombigbee Waterway decision, echoed this view: "[I]t is entirely unreasonable to think that congress intended for an impact statement to document every particle of knowledge that an agency might compile in considering the proposed action."42/

Treatment of Conflicting Professional Opinions

As the foregoing discussion suggests, the EIS must provide a full disclosure of the environmental impacts that can reasonably be expected from a proposed project. Because ecological science is a young discipline, and so many assumptions and uncertainties underlie calculations of environmental impact, disagreements may arise among professionals as to the environmental impacts that may result from agency action. Moreover, some impacts may not be examined at all, because agency personnel producing an EIS may not be aware of the need for their identification and measurement.

The courts have recognized the importance of outside opinion by requiring that agencies consult with parties likely to have knowledge about the environmental impacts of an action. Furthermore, the agencies must respond to comments, and the comments and responses must be included in environmental impact statements. The district court in the Gillham Dam case stressed the importance of revealing opposing points of view where experts (and even lay citizens) differ in their evaluation of the environmental impacts of a proposed action. Where outsiders bring alleged environmental impacts to the agency's attention, then the impact

statement "should set forth these contentions and opinions, even if the responsive agency finds no merit in them whatsoever."[43/] The court added that the agency should express its opinion with respect to these opposing contentions. "The record should be complete. Then, if the decision makers choose to ignore [impacts], they will be doing it with their eyes open."[44/]

Courts have been critical of agency failures to consult with or to respond to sources of expert comments. For example, in 1978, a district court continued its 5-year-old injunction against channelization by the Corps of the "West Tennessee tributaries." The court noted that the Corps' environmental impact statement had failed to mention a Soil Conservation Service memorandum recommending that channelization not be undertaken where the purpose is to bring new lands into agricultural production. The court had noted this memorandum in its 1972 opinion.[45/] The Corps' continuing failure to mention the memo suggested the agency "has been less than diligent in soliciting and considering the views of other federal and state agencies."[46/]

Agencies should respond to comments that are offered. For example, when enjoining work on the Tellico Dam, the district court noted that the TVA had failed to respond to comments proffered by a local regional planning organization.[47/] The district court enjoining work on the Navajo Dam powerhouse noted that implicit in the obligation to consult with others "is a further requirement that [an agency] consider and respond to...comments from another agency."[48/] The 8th Circuit, in dissolving the injunction in the Cache River case, noted that the EIS reprinted adverse comments and referred to them in its evaluation. The circuit court found that the impact statement did not "arbitrarily omit" reference to conflicting views and that it contained "sufficient reference to such views as to put decision makers on notice of their existence."[49/]

Although an agency must respond to comments, it is not required to agree with them. As the district court declared in the Auburn Dam case, "disagreement among experts will not serve to invalidate an EIS."[50/] Scientific unanimity on the desirability of proceeding with a

proposed action is not required.[51] The agency involved does not need to be subjectively impartial, but it must present the environmental impacts of a project and the controversy surrounding them with "good faith objectivity."[52]

There are various ways to meet the requirement to disclose and to respond to comments. For example, the Corps' guidelines for implementing NEPA provide for officials to summarize agency and citizen comments and to discuss them appropriately in a response. If the comment requires a change in the text of the statement, the page and paragraph altered are to be referred to in the response. The officials must also indicate where conflicts between the Corps and commenting parties have not been reconciled.[53]

In the past, agencies have satisfied judicial requirements for disclosure in a manner far less satisfactory than that provided for by the Corps guidelines. For example, in the EIS for the Gillham Dam project, the Corps attached transcripts of statements from court proceedings as an appendix to the EIS. The court found this to be satisfactory disclosure:

> It may be that the decision maker, in order to fully comprehend the objections and arguments advanced by the plaintiffs ...will have to look carefully into the "back pages" and the appendixes of the EIS. But there is no way that he can fail to note the facts and understand the very serious arguments advanced by the plaintiffs if he carefully reviews the entire environmental impact statement.[54]

This approach was also found satisfactory by the district court ruling on the adequacy of the final EIS statement for the Corps' New Hope Dam:

> The primary reason that the impact statement meets the requirement of full disclosure is because the defendants included in the statement the depositions of plaintiffs' expert witnesses.
>
> By including the actual depositions of the opposing experts, the decisionmakers can read of the alternatives, adverse effects, mistakes in calculation, and reasons that the dam should not be built in undiluted form.[55]

Although appending bulky transcripts to impact statements has been acceptable to reviewing courts as a means of providing full disclosure, the approach is assuredly <u>not</u> the most meaningful way of disclosing the

arguments regarding a project's environmental impact. Any decision-maker with limited time to review a project would likely balk at the bulk of a statement to which many pages of court testimony have been appended. It is far better simply to provide concise summaries of principal points of controversy and areas of disagreement, with appropriate citations to supporting references and data.

Incorporation of Supporting Data, Methodologies and Documentation into an Environmental Impact Statement

The EIS must be a full-disclosure document. Judicial interpretations of this requirement and resulting agency reactions have led to the production of statements which are popularly measured by their weight and width rather than by the quality of their analytical content. If it displays few data, an agency may be accused by some courts of having offered conclusory, unsupported remarks in its statement. Other courts may hold that the same remarks have been sufficiently documented, but it is evident that many agency personnel prefer to err on the side of including too many data rather than too few. Judicial guidance is not always consistent and, since reasonable individuals can disagree, what an agency deems to be reasonable exclusion of data may be deemed unreasonable by a judge.

Nevertheless, several generalizations can safely be made about prevailing judicial opinion pertaining to disclosure in impact statements of data, calculations, and references. This body of opinion provides reasonable and flexible guidance to agency decisionmakers. For example, agencies must avoid conclusory remarks. Remarks must be supported either by data included in the impact statement or by data available in readily accessible documents referenced in the statement. While important data must be included, unimportant data can be excluded. Failure to include some references will not fatally flaw an impact statement. Supporting studies must be accessible to the public, but it is not necessary for them to be attached to the impact statement.[56/] Generally speaking, courts are likely to be satisfied with less detail and more limited analysis where anticipated impacts are small in scale

or are remote.[57] Many courts will not "fly speck" impact statements[58] and many will reject "chronic fault-finding" by plaintiffs.[59] However, the courts may demand more from impact statements as the state of the art of ecological science improves.[60] These generalizations are readily illustrated by reference to court decisions involving water resource development projects.

The impact statement for the Soil Conservation Service's Chicod Creek channelization project disclosed there would be an increase in sediment load resulting from the work. Having stated this increase would occur, the impact statement asserted in one sentence that no significant reduction in downstream water quality was expected. The district court reviewing the project commented that the statement "disposed of" the environmental effects of the sedimentation in one "conclusory" statement "unsupported by empirical or experimental data, scientific authorities, or explanatory information of any kind."[61] The court added, "Where there is no reference to scientific or objective data to support conclusory statements, NEPA's full disclosure requirements have not been honored."[62]

In its review of the impact statement for the Teton Dam, the 9th Circuit commented on allegations that the statement was lacking because it failed to discuss fully supporting studies on which its conclusions were based. The court stated: "[T]he conclusory form requires that we caution...against too heavy reliance on such a form of presentation."[63]

The district court in the Stonewall Jackson Lake case agreed that an impact statement must not be conclusory. But the document is not incomplete by reason of failure to cite the scientific studies on which it relied.[64] Similarly, the district court in the Palmetto Bend Dam case adjudged the impact statement under review adequate, even though it was evident from testimony in court that certain references were not included that would have been relevant.[65] The court was evidently not bothered by the lack of citations in the Corps' responses to outside comments.

The 5th Circuit, in its review of the impact statement for the

Tennessee-Tombigbee Waterway, noted that Corps staff had not included references to all documents they had reviewed, in the interest of making their impact statements more readable. The court found that the plaintiffs failed to demonstrate they were unable to pursue any subject for lack of a documentary reference. The court also was not troubled by the Corps' failure to refer to the only archaeological study of the area, stating that the study disclosed no significant information which required express inclusion in the impact statement.[66/]

In deciding what data and discussions of methods to include in impact statements, agency decisionmakers should consider the importance of details to specialized audiences, the degree of professional disagreement over data and calculations, and the need to make a statement accessible to the general public. As the district court in the Tennessee-Tombigbee Waterway case noted, the statement "must be written in language that is understandable to nontechnical minds and yet [must] contain enough scientific reasoning to alert specialists within the field of their expertise."[67/] But, as the district court in the New Melones Dam case stated, the statement "need not be an exhaustive collection of various and sundry minute scientific details."[68/]

The judgment on inclusion of data clearly turns on perception of the data's importance. For example, in the West Tennessee Tributaries case, the Corps contended that some additional information regarding impact of flooding was present in back-up data not actually included in the impact statement. The court said it is "certainly" permissible for a statement to refer to additional information of ancillary importance without actually reprinting it. However, in this instance, the flood control information was of "central importance" to the project and must be included. The court continued, "The present EIS does not alert the reader to the existence of back-up flood control data, nor to the significance of such data.... Even if the existence of such backup data were proved, the deficiencies of the EIS would not be cured.[69/]

Similarly, in the Auburn Dam case, the district court noted that the figures for the demand for water from the project "are stated in the EIS as mere conclusions, without any discussion of calculations

used by the Bureau to arrive at them."[70] Because sufficient doubt had been raised concerning the accuracy of the demand figures, the court insisted that the actual demand, and the method by which it was determined, be "thoroughly and objectively" discussed in the statement. The court stated that without such a "critical analysis" of the demand for water, it would be impossible to evaluate alternatives to the project in a realistic fashion.[71]

Judicial desires with respect to disclosure of data, methods, and sources, have been elaborated upon in reviews of the benefit-cost analyses found in some impact statements. As noted in the next section of this report, courts have disagreed over the extent to which benefit-cost analyses must be included in impact statements and the extent to which they will be judicially reviewed.[72] It is nevertheless reasonable to assume that the disclosure requirements established for benefit-cost calculations should apply to the more direct environmental impacts on which the impact statement is supposed to focus.

In its first decision in the Tellico Dam case, the district court noted that the draft statement's benefit-cost analysis consisted almost entirely of unsupported conclusions. As a result, a nonexpert reader was denied the opportunity to evaluate these conclusions and the thoroughness and relative merit of the research upon which they were based.[73] The TVA then submitted a revised impact statement which included a detailed critique and defense of its benefit-cost methodology. The court, in accepting the revised statement, noted the importance of laying out the methodology; this would be important to Congress, agencies, and the public in fully evaluating the effects of the project.[74]

The district court in the Truman Dam case evinced similar concern with disclosure of methodology. The court stated that Congress required an agency to set forth adequately the basis for arriving at a particular benefit-cost ratio.[75] Moreover, the final impact statement must adequately state legitimate conflicting views regarding the calculations.[76]

The 8th Circuit seemed somewhat less demanding with regard to

incorporation of methodology in the impact statement. In its Cache River decision, it noted that a detailed summary of the benefits, costs, and benefit-cost ratios of alternatives, both with and without mitigation, was included in the impact statement. The statement indicated that the procedures, methodology, and sample calculations would be available upon request. The 8th Circuit held this was sufficient disclosure to satisfy NEPA.[77]

The district court in the Rouge River case demanded even less, but its ultimate objective was the same as the 8th Circuit's. It noted that the Corps used conclusions in the computation of its benefit-cost ratio and omitted the data on which the conclusions were based. Omission of the data from the impact statement did not violate the statutory mandate of NEPA, in part because comments on the statement would put the decisionmaker on notice of objections to the calculations. Then the decisionmaker could request the supporting data "if he deemed the omission substantial, material, or in some other manner important...."[78] The court continued that the rule of reason "says that some conclusions without supporting data are acceptable. Implicit in this rule is the statement that not all omissions are such as to force a conclusion that a NEPA environmental impact statement is not sufficiently detailed."[79]

As the preceeding review of individual cases suggests, courts have not been as consistent as might be desirable regarding the rules for inclusion of material in the EIS.

Quantification of
Environmental Impacts

Section 102(2) (B) of NEPA requires adequate consideration in agency decisionmaking of hitherto unquantified environmental amenities. The question raised in some cases is whether quantification is required for "consideration" to be "adequate." Although some courts believe quantification should be attempted to the extent possible,[80] the prevailing judicial view is that quantification is not a prerequisite to adequate consideration of hitherto unquantified environmental values. Moreover, when calculations underlying attempted quantification are in

dispute, the full range of conflicting opinion should be revealed in the EIS.

The 5th Circuit, in its opinion in the Tennessee Tombigbee Waterway case, commented that section 102(2) (B) could not be "fairly read to command an agency to develop or define any general or specific quantification process."[81/] The court stated that the subsection orders "no more than that an agency search out, develop, and follow procedures reasonably calculated to bring environmental factors to peer status with dollars and technology in their decisionmaking."[82/] In an earlier decision, the same circuit had declared that NEPA "does not demand that every federal decision be verified by reduction to mathematical absolutes for insertion into a precise formula."[83/]

The district court reviewing the Tellico Dam project reached a somewhat similar conclusion. It stated that section 102(2) (B) does not require an agency to compute in dollar figures every environmental loss. It "merely requires methods and procedures for appropriate consideration of presently unquantified amenities, not the development of procedures of mathematical equivalence."[84/]

One reason the courts do not insist on quantification is that they have reservations as to whether it can be done in a meaningful way. For example, in reviewing the impact statement for the Teton Dam, the 9th Circuit responded as follows to the plaintiffs' contention that a formal benefit-cost analysis should be included in it:

> We do not believe such analysis is necessary to enable an EIS to serve the purposes for which it is designed.
>
> This conclusion rests upon the hard fact that there is sufficient disagreement about how environmental amenities should be valued to permit any value so assigned to be challenged on the grounds of its subjectivity. It follows that in most, if not all, projects the ultimate decision to proceed...is not strictly a mathematical determination. Public affairs defy the control that precise quantification of its issues would impose. [This is not to say] that under no circumstances should the EIS contain a numerically expressed cost-benefit analysis.[85/]

The district court in the Gathright Dam case was similarly concerned about difficulties in quantification. Citing earlier decisions

in the Gillham Dam case, it suggested that failure to quantify such environmental amenities as free-flowing streams did not render the impact statement deficient. The court said it did not seem possible to calculate such values, and the plaintiffs had not suggested a method for doing so. The court insisted, however, that the impact statement had to note a deficiency existed in this regard.[86]

Although courts may excuse a lack of quantification, agencies should not anticipate that their consideration of unquantified amenities will escape close judicial scrutiny. The district court in the West Tennessee tributaries channelization case, in discussing the Corps' mitigation plans, reiterated the importance of the agency proving that it has taken steps to give due consideration to unquantified values:

> The EIS and Mitigation Plan must affirmatively show that the Corps has made an in-depth study of these unquantified values that are to be lost and has made an objective judgment as to the effect such loss should have on the decision to drain these wetlands and on the decision... as to how much mitigation land should be purchased and developed.[87]

In reviews of water resource development projects, the quantification issue has been addressed by the courts both within and outside discussions of benefit-cost analysis. Courts disagree on the propriety of reviewing benefit-cost analyses. In those courts that do not review them, the quantification question in this context is moot. In other courts, the numbers in benefit-cost analyses are reviewed quite closely. Those courts scrutinizing benefits and costs have expressed concerns about the use of an appropriate discount rate for benefits and costs, use of an appropriate project life, and quantification of environmental impacts that represent costs to the same extent that similar environmental impacts that represent benefits are quantified. A full discussion of quantified environmental values in benefit-cost analysis is provided in the legal literature on NEPA litigation.[88]

Documentation and
Quantification for Matrix
Analyses of Environmental Impacts

Because matrix approaches to impact assessments are frequently used, particular attention was paid in review of legal decisions to courts'

examination of impact matrices. In only two cases have courts scutinized carefully agencies' use of matrices. In both, agency decision-making was found by appellate courts to be substantially in compliance with NEPA, although in one the agency's procedures were found to be inadequate during the initial review by a district court. Minnesota Public Interest Research Group v. Butz.[89/] This litigation was a challenge to the adequacy of the final EIS accompanying the Land Use Management Plan for the Boundary Waters Canoe Area (BWCA).[90/] The BWCA, administered by the Forest Service, comprises 1.03 million acres of land and water in northern Minnesota.

In its impact statement, the Forest Service posed for examination six alternative management approaches. The six, which were "packages" of discrete policies (timber management, wildfire management, motorboat control, etc.), had been developed on the basis of a program of extensive public participation. The six packages were rated on a three-point scale for their responsiveness to six selected values. The Forest Service had concluded that these six values sum up the unique qualities of the Canoe Area worthy of preservation. The Forest Service's preferred alternative scored the highest number of total points. See Figure 1. The Service also rated the six packages for their responsiveness

Values	Alternatives					
	1	2	3	4	5	6
Natural Beauty of the Shorelines	3	3	3	2	2	2
Water Travel Network	2	2	3	2	2	2
Vegetation	3	2	2	2	1	1
Wildlife	3	2	2	2	1	1
Recreation Experience	2	3	3	3	3	2
Research Opportunity	1	2	2	2	3	3
Total	14	14	15	13	12	11

Key: 3 = best response to values
2 = average response to values
1 = least response to values

Source: "See Figure III-2, page 113, reference given in footnote 90"

Figure 1. Comparison Evaluation of Alternatives on the Inherent Values of the BWCA

to several statutorily established goals. Again, the preferred alternative scored the highest number of points. See Figure 2.

Descriptions of the six alternatives were supplemented by a series of matrices. The matrices, represented by the Service as the core of its environmental impact assessment, are reprinted in part in Appendix C of this report. The matrices graphically portrayed the impact of alternative management activities and uses on a host of environmental factors. Such activities as soil management, water level management, and wildfire management were listed in the rows of the matrices. Environmental factors (physical, biological, cultural, and economic) were listed in the columns. In each matrix cell, four notations were made. Denoted were the character (direct or indirect), magnitude (major or minor), and duration (long or short) of the effects (favorable or adverse) of each management activity on each environmental factor. Marginal notations indicated the major directions for management activities dictated by applicable laws and opportunities for mitigating principal adverse effects.

The district court found the final impact statement inadequate on several grounds. The Forest Service arbitrarily assigned rankings to alternatives without revealing the reasons underlying the rankings. The court noted allegedly illogical conclusions and stated, "This type of evaluation does not give the reader of the EIS even a vague idea as to the reasoning process behind the Forest Service's conclusion.... There is no explanation as to how the numerical values are determined, nor are they in any way related to the preceding discussion."[91/] The court added, elsewhere in its opinion, "It appears to be the typical practice of the Forest Service throughout the EIS to either leave the important conclusions unexplained, as in the matrices, or else arbitrarily assign numbers without explanation and then use them to reach the desired conclusion."[92/]

The eight judges of the 9th Circuit Court of Appeals unanimously reversed the district court decision. They held that the district court judge had substituted his judgment for that of the Forst Service without a sufficient basis or need therefore and that in all but one respect

Assigning values of 3, 2, or 1, Alternatives can be compared as to the extent they carry out national goals, management goals, and the existing legal framework.

Goal	Alternatives 1	2	3	4	5	6
(1) Fulfill the responsibilities of each generation as trustee of the environment for succeeding generations: The Wilderness Act calls for preserving the wilderness character, and devoted to the public purposes recreational, scenic, scientific, educational, conservation, and historical use.	1	2	3	2	2	2
(2) Assure for all Americans safe, healthful, productive, and aesthetically and culturally pleasing surroundings.	1	2	3	2	2	1
(3) Attain the widest range of beneficial uses of the environment without degradation, risk to health or safety, or other undesirable and unintended consequences.	2	3	3	2	1	1
(4) Preserve important historic, cultural and natural aspects of our national heritage, and maintain, wherever possible, an environment which supports diversity and variety of individual choice (values).	2	3	3	3	3	2
(5) Achieve a balance between population and resource use which will permit high standards of living and a wide sharing of life's amenities.	1	1	1	1	1	1
(6) Enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources.	2	2	2	2	1	1
(7) To the fullest extent possible, administer the area in accordance with the statutes and treaties now governing the management and administration of the BWCA.	2	2	3	2	2	1
(8) Preserve and perpetuate the primitive character of the area, particularly the lands with unique water-related characteristics in the vicinity of lakes, streams, portages, and trails.	2	3	3	2	1	1
Total	13	18	21	16	13	10

Using the above criteria, Alternative 3 best responds to the management goal and those set forth in the National Environmental Policy Act and meets the prescribed legal framework. The other Alternatives respond to a lesser degree in this order: 2, 4, 5, 1, and 6.

Source: "See Figure III-2, page 113, reference given in Footnote 90"

Figure 2. Alternative comparison-goals

the Forest Service had complied adequately with NEPA's procedural and substantive requirements.[93]

The judges found the treatment of alternatives to be adequate. With regard to the district court's challenge to the Forest Service's methodology in rating the alternatives and in assigning specific values to them, the judges commented:

> We reject this attempt to discredit the scientific conclusions contained in the EIS. The conclusions are supported by data in the record. When so supported, quantification of data and resolution of the scientific conflicts presented by it are matters for the experts, not the courts.[94]

The appeals court judges also disagreed with the district court's conclusion that the matrices' conclusions were illogical. They stated there was nothing in the record to indicate that the conclusions in the matrices were reached "after less than good faith study."[95] The conclusions were reached after "intensive study by experts in various fields" and after "good faith debate with the Forest Service staff."[96]

The judges cited the impact statement's warning that, because it is impossible to predict the exact effect of a use or activity, the matrices were not the final word on environmental impact. The judges added that significant environmental effects were presented in a form which provides the interested decisionmaker an opportunity to weigh them. They stressed the utility of such a compressed analysis:

> The matrices digest thousands of pieces of information. Each explains the present management policy with respect to the activities and uses analyzed.
>
> Each explains ways in which the activities and uses could be mitigated. To require a narrative paragraph in lieu of each bit of information in this case would produce an unworkably cumbersome document which would be of questionable usefulness to the decisionmaker.[97]

The judges then cited the CEQ guidelines urging agencies to convey information in readily understandable form and noted their agreement with the court in the Gathright Dam case that "[m]ethods of quantification are without question matters of judgment and opinion" and as such, belong within the discretion of the Forest Service.[98]

The judges commented that NEPA did not contemplate that a court

should make choices between two competing schools of scientific thought. Accordingly, a court should not disapprove any impact statement which reached a scientific conclusion different from its own.[99/] The judges suggested that the district court's effort to discredit the matrix approach by "second-guessing" the values assigned to specific environmental impacts was "clearly improper."[100/] They added, "In the absence of a showing of arbitrariness, the values to be assigned such impacts rest within the Forest Service, and the experts at its disposal, not the district court."[101/] They concluded that in the absence of a showing of arbitrariness and capriciousness the matrix approach sufficiently described the environmental impacts.

Sierra Club v. Morton.[102/] This litigation was a challenge to the adequacy of the final EIS for the Bureau of Land Management's (BLM's) sale of oil and gas leases on the Outer Continental Shelf (OCS) off the shore of Mississippi, Alabama, and Florida. BLM had constructed a matrix for each potentially leasible OCS tract. See Appendix D. The matrices were employed to rank tracts on the basis of the potential environmental impact of their development. On the horizontal axis of each matrix were placed the impact-producing factors--man-made structures and oil spills. On the vertical axis were placed the coastal resources and activities which the factors might impact. These coastal resources were components of the natural resource system, and the activities included shiping, recreation, and commercial and sports fishing.

Each impact producing activity was evaluated on the basis of two criteria: (1) importance (potential magnitude and persistence) and (2) proximity (distance from high value natural resources or from economic and cultural activities.

BLM specified its assumptions in the impact statement as to its measurement of "importance." Three structures were assumed per each tract of 5000 acres or more, to be on site for 15-20 years. Oil spills were estimated to be 1,000 barrels or more, of a duration from 1-90 days. Importance of structures and spills was then scaled from 0-100, based on magnitudes indicated in the impact statement.

With respect to "proximity," a value of 1.0 to 0.0 was assigned

for the distance of a structure to a shipping lane, to a natural resource system, or to other designated areas of importance. BLM then indicated its assumptions regarding rate of travel and direction of an oil spill and ranked tracts on a scale of 1.0 to 0.0 based on their location.

The relative environmental impact factor for a given tract was calculated by multiplying the importance and proximity values of structures and oil spills on it. Alternative management plans were based on the relative environmental impacts thus calculated.

BLM's matrices were included as an appendix to the impact statement. A summary of the conclusions developed in the matrices was included in the impact statement following a summary of the methodology and assumptions employed. See Appendix D.

The Sierra Club sued BLM, alleging violation of NEPA. In an unpublished opinion, a district court sustained the adequacy of the impact statement. The Sierra Club appealed to the 5th Circuit. The Club contended that the matrix analysis was insufficient because the values assigned were arbitrary, because the analysis falsely assumed that all oil spills would be cleaned up within a few days, and because the proximity values did not consider the possibility of oil spills which did not occur at drilling platforms. The Sierra Club also cited an earlier report on OCS development which in its view had employed a more satisfactory method of projecting the likelihood of oil spills reaching shore. In the earlier report, CEQ had included specific calculations of the results of spills from 23 sites along the Atlantic coast and Gulf of Alaska.

The 5th Circuit rejected the Sierra Club's claims. The appellate judges said that the use of the matrix approach, instead of the more detailed CEQ approach, did not demonstrate lack of good faith on the part of BLM. The matrix gave a decisionmaker necessary quantitative information concerning oil spills. The Court continued that any analysis of future oil spills necessarily involves a degree of speculation, so "every attempt to select quantitative values will be to some extent arbitrary."[103/] The use of proximity and importance scales, said the

court, was no more arbitrary than CEQ's selection for analysis of 23 points on the Atlantic Coast and Gulf of Alaska. The court rejected the balance of Sierra Club's claims with respect to the matrix, saying that non-platform spills were adequately treated elsewhere in the impact statement and that though the assumption about the time required to clean up a spill may be inadequate, this did not affect the court's judgment as to the sufficiency of the statement.[104/]

Other Cases. Matrices were employed in the statement litigated in the Gillham Dam case and in the statement on OCS leasing litigated in Natural Resources Defense Council v. Morton,[105/] but they did not figure in the judicial holdings in these cases. A matrix approach to analysis of impacts was suggested for the Corps' consideration by the district court in the Wallisville Dam case.[106/]

Treatment of Alternatives

Two sections of NEPA, sections 102(2) (C) and 102(2) (E), call for the examination of alternatives to proposed agency actions. In their review of agency treatment of alternatives in EIS's, courts claim to apply a rule of reason. Once again, since reasonable individuals can disagree, what an agency may regard as a reasonable treatment of alternatives may be regarded as inadequate by a reviewing court. Three judge appellate panels can even disagree within themselves. For example, in Natural Resources Defense Council v. Morton, the seminal decision in which the basic judicial rules for evaluation of alternatives were first elaborated, the alternatives the two-judge majority viewed as reasonable and meriting discussion were viewed by the dissenting judge as not reasonable and therefore not worthy of discussion.[107/]

Courts have held that crystal ball inquiries by agencies are not required.[108/] Detailed discussion of the environmental effects of alternatives which are only remote and speculative possibilities is not necessary, nor is detailed discussion necessary where the effects of alternatives cannot be readily ascertained.[109/] Alternatives must be discussed even if they lie beyond an agency's statutory authority.[110/] Alternatives to be discussed might include no action, delayed action, mixes of structural and non-structural activities (in the case of water

resources development), mixes of operation procedures, and damage mitigation strategies.

The environmental effects of alternatives must be explained and compared. Alternatives that are unrealistic need not be discussed or can be mentioned only briefly.[111] Information must be "sufficient to permit a reasoned choice of alternatives so far as environmental aspects are concerned."[112] There must be discussion of alternatives that are put forward by respectable opinion.[113] Discussion cannot be so conclusory or so brief that meaningful comparison is precluded.[114] Discussion can be reasonably related to the size or scope of a project.[115] The scope of reasonable alternatives may be influenced by the extent to which work on a project has already been undertaken.[116] To assure that environmental values can be given appropriate consideration along with economic and technical considerations, the discussion should not be limited solely to those alternatives that provide economic benefits commensurate with those of the proposed project.[117]

The district court in the Gathright Dam case held that NEPA does not require massive studies of alternatives whose feasibility can be determined after only minor study.[118] The same court stated an agency can rely on its past experience, judgment, and knowledge of an area when making determinations of feasibility.[119] But if an agency relies on its past knowledge, it should heed the warning of the district court reviewing the impact statement for a powerhouse at the Bureau of Reclamation's Navajo Dam. The court noted the agency's courtroom rationalizations for having rejected particular alternatives and declared that these "find their proper place" in the final EIS.[120] The court seemed to be suggesting that the bases for agency judgments of feasibility should not be stated so curtly as to be conclusory.

The D.C. Circuit has declared that the EIS "must explain the basis for each conclusion that further consideration of a suggested alternative is unwarranted."[121] The Supreme Court has stated somewhat opaquely that this rationale "is not entirely unappealing as an abstract proposition."[122] The Supreme Court added that the term "alternatives" is not "self-defining," and that the concept of "alternatives" is an

evolving one requiring an agency to explore more or fewer alternatives as they become better known and understood.[123] The Supreme Court's view of alternatives is likely not dramatically different from that of the experienced administrator.

The Role of the Interdisciplinary Team. Section 102(2) (A) of NEPA calls for agencies to use a systematic interdisciplinary approach to insure appropriate consideration of environmental concerns in their decisionmaking. A recent analysis of the Corps' implementation of NEPA suggests that, at best, the Corps has engaged in multidisciplinary planning, but it has not engaged in interdisciplinary planning.[124] A variety of disciplines are employed in multidisciplinary planning, but each is not involved in shaping the planning process per se. Rather, each supplies inputs specified by the planner in charge. In contrast, an interdisciplinary approach involves an integrated effort in which specialists from various disciplines interact to a high degree in a manner which indeed shapes the planning process.[125]

Few courts have concerned themselves with the question of whether an agency has employed an interdisciplinary team. Several judicial decisions have briefly mentioned the backgrounds of those involved in impact statement preparation and have noted how teams worked together on projects.[126] However, no courts have drawn a distinction between interdisciplinary and multidisciplinary planning. Courts routinely note inadequacies in impact statements, but they do not appear to relate these to the composition of the agency team.[127]

The proposed CEQ regulations for implementing NEPA call for the identification of the backgrounds of those who have prepared an impact statement.[128] Some agencies reportedly believe that such a requirement will provide fertile grounds for litigating the question of whether a team contains the right mix of disciplines for planning a project.

THE RELEVANCE OF NEPA CASE LAW TO CORPS PROCEDURES

Corps Regulations

The Corps has issued several sets of regulations designed to

respond to various executive and legislative mandates. Its regulations for preparation of EIS's are quite comprehensive and, if followed, should lead to the preparation of impact statements acceptable to the judiciary.[129] The guidance in Corps guidelines (which reflects the judicial holdings previously described) includes instructions to:

1) cite sources, make appropriate references, and indicate how documents summarized in the impact statement can be obtained,[130]
2) avoid slighting or ignoring adverse effects in an effort to justify an action previously recommended or currently supported,[131]
3) summarize accurately detailed appraisals of other agencies and concerned environmental groups and provide evaluation of these appraisals,[132]
4) make every effort to obtain quantifiable values and describe the nature and extent of nonquantifiable tradeoffs,[133]
5) provide qualitative descriptions of unquantifiable costs and benefits with assumptions or criteria on which judgments are based,[134] and
6) include and discuss irreconcilable opposing views.[135]

Further relevant guidance is provided in Corps regulations for planning consistent with the Water Resources Council's Principles and Standards.[136] These call for "interdisciplinary" planning. Although not all team members must be involved in each activity or task, they must be involved in such a fashion that they can have a "material effect on study progress and output."[137] Corps planners must evaluate a broad range of alternatives using evaluation criteria that include risk and uncertainty analysis.[138]

Corps regulations for implementing section 122 of Public Law 91-611 yield still further guidance.[139] They require Corps planners to be explicit about assumptions or criteria underlying judgments about project effects.[140] The appendices to the section 122 regulations list causative factors and project effects which merit discussion and evaluation. The lists are illustrative and not limiting, but they mention several effects which one court or another has found to be insufficiently

treated in an environmental impact statement.[141]/

Conclusions

Quantitative calculations may sometimes appear to courts to be based on questionable assumptions. However, more likely than not, courts will not reject a decision based upon the calculations, out of reluctance for substituting their judgment for that of the agencies.[142]/ Where quantitative calculations are controversial, it appears that courts usually will be satisfied with a full disclosure of the range of controversy. Quantitative analyses should be able to withstand the most rigorous judicial reviews, provided they adhere scrupulously to existing Corps regulations.

The NEPA cases that appear to be of greatest relevance are the two which explore matrix analyses in detail. The Forest Service impact statement litigated in the Boundary Waters Canoe Area case was approximately 270 pages long. The BLM statement litigated in the OCS leasing case was approximately 1100 pages long, exclusive of comments. The approach adopted by the BLM in its matrix analysis was somewhat superior to that adopted by the Forest Service. In its impact statement, the BLM clearly spelled out the assumptions underlying its quantitative matrix analysis and clearly delineated the basis for its numerical rankings. In contrast, the Forest Service did not so clearly delineate the assumptions underlying its ranking of alternatives and may have crammed too much information in abbreviated form into its matrices. The 8th Circuit, in its review of the Forest Service matrices and rankings of alternatives, suggested that further elaborations by the Service would have bogged the statement for the Boundary Waters Canoe Area in bulky detail. To be sure, there existed a risk of creating a quagmire. But enough questions were raised by the district court about the Service's calculations and rationale that some brief explanations should have been added to the statement. These would have been useful to the outside reviewer and would not necessarily have overloaded the statement. Admittedly, this is a delicate judgment reached by the social scientist author of this report. Other professionals might reasonably reach a different conclusion.

If a matrix analysis is to be used in the comparison of the environmental impacts of alternative proposals, at the very least the principal summary tables must be included in impact statements. The principal assumptions underlying the calculations made, the rationale for selecting one model for predicting impacts in lieu of another, and the uncertainty attached to projections should be indicated, with references to supporting documentation when appropriate. Indications of assumptions and uncertainties are particularly important where professionals are ranking otherwise nonquantifiable impacts, where they lack data on experience with comparable projects, or where they lack baseline data on the basis of which to predict impacts with great certainty. Many of the subordinate calculations and citations can be relegated to an appendix. In instances where the Corps believes the calculations focus on impacts which are relatively insignificant or which are not likely to be controversial, the supporting calculations can be referenced in the impact statement with an indication that they are available for review by outside parties.

These recommendations comport with Corps regulations, respond to the intent of applicable laws, and find a basis in prevailing court interpretations of NEPA.[143/]

FOOTNOTES

1) Public Law No. 91-190, 42 U.S.C. §4321 et seq. See Appendix A for the text of the statute.

2) 35 Fed. Reg. 4247 (March 5, 1970), as amended by E.O. 11991, 42 Fed. Reg. 26967 (May 25, 1977).

3) Public Law No. 91-611, 84 Stat. 1823.

4) 38 Fed. Reg. 24778 (September 10, 1973).

5) 40 C.F.R. §1500; 38 Fed. Reg. 20550 (August 1, 1973).

6) 33 C.F.R. §209.410; 39 Fed. Reg. 12737 (April 8, 1974).

7) A list of this litigation is attached as Appendix B. When these cases are mentioned in the text, only "short-form" citations are provided in the footnotes. These footnotes indicate that Appendix B should be consulted for full citations. Not all opinions involving the four agencies were reviewed, since many are not published in the principal law reporting services (West's, Environment Reporter, and Environmental Law Reporter). For a complete summary of environmental litigation involving the Corps, see "Status of Environmental Litigation," (Washington: Office of the Chief of Engineers, Pamphlet No. 27-1-1, 24 April 1978).

8) Only two cases, offering reviews of matrix approaches to impact assessment, were considered relevant to this report.

9) A select bibliography is attached as Appendix E.

10) See Appendix A.

11) 115 Cong. Rec. 40419-40420 (December 20, 1969).

12) 115 Cong. Rec. 40425 (December 20, 1969).

13) See the discussion in Chapters 3 and 4 of Richard A. Liroff, A National Policy for the Environment (Bloomington: Indiana University Press, 1976).

14) Frederick R. Anderson, NEPA in the Courts (Baltimore: Johns Hopkins Press for Resources for the Future, 1973); Frederick R. Anderson, "The National Environmental Policy Act," in Erica Dolgin and Thomas Guilbert (eds.) Federal Environmental Law (St. Paul: West Publishing Company, 1977); Richard A. Liroff, The Environmental Impact Statement Process Under NEPA - II (Washington: Environmental Law Institute, 1977).

15) Scientists' Institute for Public Information v. Atomic Energy Commission, 3 ELR 20525, 20531 (D.C. Cir., 1973).

16) Calvert Cliffs' Coordinating Committee v. Atomic Energy Commission, 449 F.2d 1109, 1 ELR 20346 (D.C. Cir., 1971).

17) See, e.g., Citizens for Reid State Park v. Laird, 2 ELR 20122 (D. Me., 1972).

18) See, e.g., Environmental Defense Fund v. Froehlke (Truman Dam). See Appendix B.

19) See the discussion in Note, "The Least Adverse Alternative Approach to Substantive Review Under NEPA," 88 Harv. L. Rev. 735 (1975).

20) The leading decision in which these guidelines were laid down is Citizens to Preserve Overton Park v. Volpe, 401 U.S. 402, 1 ELR 20110 (U.S., 1971). See also, Harold Leventhal, "Environmental Decisionmaking and the Rule of the Courts," 122 U. of Pa. L.R. 509 (1974).

21) See note 21 in Kleppe v. Sierra Club, 427 U.S. 390, 6 ELR 20532 (U.S., 1976).

22) See Environmental Defense Fund v. Corps of Engineers (Tennessee-Tombigbee Waterway), 384 F. Supp. 916, 2 ELR 20536 (N.D. Miss., 1972). See Appendix B.

23) See Cape Henry Bird Club v. Laird (Gathright Dam), 359 F. Supp. 404, 3 ELR 20571 (W.D. Va., 1971). See Appendix B.

24) See, e.g., United Family Farmers, Inc. v. Kleppe (Oahe Project), 418 F. Supp. 591, 6 ELR 20758 (D. S. Dak., 1976). See Appendix B.

25) See, e.g., Minnesota Public Interest Research Group v. Butz, discussed at length in the text below.

26) Environmental Defense Fund v. Corps of Engineers (Gillham Dam), 1 ELR 20130, 20141 (E.D. Ark., 1972). See Appendix B.

27) Id.

28) Environmental Defense Fund v. Corps of Engineers (Gillham Dam), 2 ELR 20353, 20354 (E.D. Ark., 1972). See Appendix B.

29) Environmental Defense Fund v. Tennessee Valley Authority (Tellico Dam), 2 ELR 20044, 20045 (E.D. Tenn., 1972). See Appendix B.

30) Environmental Defense Fund v. Froehlke (Cache River Project), 3 ELR 20001, 20003 (8th Cir., 1972). See Appendix B. Emphasis in the original.

31) Id.

32) Id., citing Ely v. Velde, 451 F.2d 1130, 1130 (4th Cir., 1971).

33) Id., 3 ELR at 20001.

34) Environmental Defense Fund v. Corps of Engineers (Tennessee-Tombigbee Waterway), supra note 22, 2 ELR at 20542.

35) Id.

36) Trout Unlimited v. Morton (Teton Dam), 5 ELR 20151, 20154 (9th Cir., 1974). See Appendix B.

37) Environmental Defense Fund v. Tennessee Valley Authority, 4 ELR 20225, 20225 (6th Cir., 1974). See Appendix B.

38) Id.

39) Environmental Defense Fund v. Corps of Engineers (Gillham Dam), supra note 28, 2 ELR at 20355.

40) Id., 2 ELR at 20354.

41) Environmental Defense Fund v. Corps of Engineers (Tennessee-Tombigbee Waterway), supra note 22, 2 ELR at 20540.

42) Environmental Defense Fund v. Corps of Engineers (Tennessee-Tombigbee Waterway), 4 ELR 20320, 20335 (5th Cir., 1974). See Appendix B.

43) Environmental Defense Fund v. Corps of Engineers (Gillham Dam), supra note 26, 1 ELR at 20141. There is some disagreement among the courts as to whether all the views expressed, or only those that are "responsible" need to be included in the impact statement. The D.C. Circuit has held that only responsible opposing views need to be included in the impact statement. The D.C. Circuit has held further that only "meaningful reference" need be made to outside comments. See Committee for Nuclear Responsibility v. Schlesinger, 463 F.2d 783, 787 (D.C. Cir., 1971).

44) Id.

45) Akers v. Resor, 3 ELR 20157, 20158 (W.D. Tenn., 1972). See Appendix B.

46) Akers v. Resor, 8 ELR 20388, 20390 (W.D. Tenn., 1978). See Appendix B.

47) Environmental Defense Fund v. Tennessee Valley Authority (Tellico Dam), supra note 29, 2 ELR at 20045.

48) National Wildlife Federation v. Andrus (Navajo Dam), 7 ELR 20526, 20529 (D.D.C., 1977). See Appendix B.

49) Environmental Defense Fund v. Froehlke (Cache River) sub nom Environmental Defense Fund v. Hoffman, 8 ELR 20056, 20061 (8th Cir., 1977). See Appendix B.

50) National Resources Defense Council v. Stamm (Auburn Dam), 4 ELR 20463, 20468 (E.D. Cal., 1974). See Appendix B. Citations omitted.

51) Id.

52) Environmental Defense Fund v. Corps of Engineers (Gillham Dam), 2 ELR 20740, 20743 (8th Cir., 1972). See Appendix B.

53) ER 1105-2-507, "Preparation & Coordination of Environmental Statements" (15 April 1974), page C-9.

54) Environmental Defense Fund v. Corps of Engineers (Gillham Dam), supra note 28, 2 ELR at 20355.

55) Conservation Council of North Carolina v. Froehlke (New Hope Dam), 2 ELR 20155, 20156 (M.D. N.C., 1972).

56) Life of the Land v. Brinegar, 3 ELR 20811, 20814 (9th Cir., 1973).

57) Rodgers, supra note 14, page 733.

58) Lathan v. Brinegar, 506 F.2d 677, 693, 4 ELR 20802, 20808 (9th Cir., 1974).

59) Lathan v. Volpe, 350 F. Supp. 262, 266, 2 ELR 20545, 20547 (W.D. Wash., 1972).

60) Rodgers, supra note 14, page 724.

61) Natural Resources Defense Council v. Grant, 3 ELR 20176, 20178 (E.D. N.C., 1973). See Appendix B.

62) Id.

63) Trout Unlimited v. Morton, supra note 36, 5 ELR at 20154.

64) Upper West Fork River Watershed Association v. Corps of Engineers, 414 F. Supp. 918, 927 (N.D. W.Va., 1976). See Appendix B. The court also held that the scientific studies should be readily accessible although it did not indicate how an outside reviewer might know what specific documentation to request if it was not cited in the impact statements.

65) Sierra Club v. Morton (Palmetto Bend Project), 10 ERC 1467, 1469 (S.D. Tex., 1975). See Appendix B. The court noted that citation to authority appeared throughout the statement.

66) Environmental Defense Fund v. Corps of Engineers (Tennessee-Tombigbee Waterway), supra note 42, 4 ELR at 20334-36.

67) Environmental Defense Fund v. Corps of Engineers (Tennessee-Tombigbee Waterway), supra note 22, 2 ELR at 20542.

68) Environmental Defense Fund v. Armstrong, 2 ELR 20735, 20737 (N.D. Cal., 1972). See Appendix B. Citation omitted.

69) Akers v. Resor, supra note 46, 8 ELR at 20389.

70) Natural Resources Defense Council v. Stamm (Auburn Dam), supra note 50, 4 ELR at 20467.

71) Id.

72) Corps guidance on the inclusion of benefit-cost data in impact statements is found in ER 1105-2-507, supra note 53, page C-3.

73) Environmental Defense Fund v. Tennessee Valley Authority (Tellico Dam), supra note 29, 2 ELR at 20045.

74) Environmental Defense Fund v. Tennessee Valley Authority (Tellico Dam), 4 ELR 20120, 20122 (E.D. Tenn., 1973). See Appendix B.

75) Environmental Defense Fund v. Froehlke (Truman Dam), 4 ELR 20062, 20066 (W.D. Mo., 1973).

76) Id.

77) Environmental Defense Fund v. Froehlke (Cache River Project), sub nom Environmental Defense Fund v. Hoffman, supra note 49, 8 ELR at 20061-62.

78) McPhail v. Corps of Engineers (Rouge River Project), 3 ELR 20237, 20239 (E.D. Mich., 1972). See Appendix B.

79) Id.

80) See Rodgers, supra note 14, and cases cited therein.

81) Environmental Defense Fund v. Corps of Engineers (Tennessee-Tombigbee Waterway), supra note 42, 4 ELR at 20333.

82. Id.

83) Sierra Club v. Lynn, 502 F.2d 43, 61 (5th Cir., 1974), cited in Sierra Club v. Morton (Palmetto Bend Project), supra note 65.

84) Environmental Defense Fund v. Tennessee Valley Authority (Tellico Dam), supra note 74, 4 ELR at 20123. Emphasis in the original.

85) Trout Unlimited v. Morton (Teton Dam), supra note 36, 5 ELR at 20155.

86) Cape Henry Bird Club v. Laird (Gathright Dam), supra note 23, 3 ELR at 20575.

87) Akers v. Resor, supra note 45, 3 ELR at 20158.

88) This brief treatment of benefit-cost analysis is based on an agreement that this subject would be accorded little attention in this report. For law journal reviews of litigation on this subject, see Note, "Cost-Benefit Analysis in the Courts: Judicial Review Under NEPA," 9 Georgia Law Review 417 (1974); Steven O. Rosen, "Cost-Benefit Analysis, Judicial Review, and the National Environmental Policy Act," 7 Environmental Law 363 (1977); and Note, "Environmental Impact Assessment for Water Resource Projects: The Army Corps of Engineers," 45 George Washington Law Review 1095 (1977).

89) 401 F. Supp. 1276, 2 ELR 20133 (D. Minn., 1975) Rev'd 541 F.2d 1292, 6 ELR 20736 (8th Cir., 1976).

90) Forest Service, U.S. Department of Agriculture, "Boundary Waters Canoe Area Management Plan and Environmental Statement," (USDA-FS-R9-FES-Adm-74-1, June 28, 1974).

91) Minnesota PIRG v. Butz, supra note 89, 6 ELR at 20153.

92) Id., 6 ELR at 20154.

93) Minnesota PIRG v. Butz, supra note 89, 6 ELR at 20739.

94) Id., 6 ELR at 20741, citing Environmental Defense Fund v. Froehlke (Truman Dam), 368 F. Supp. 231, 240 (W.D. Mo., 1973). See Appendix B.

95) Id., 6 ELR at 20739.

96) Id.

97) Id., 6 ELR at 20739-40.

98) Id., 6 ELR at 20740, citing Cape Henry Bird Club v. Laird (Gathright Dam), supra note 23, 359 F. Supp. at 415.

99) Id., citing EDF v. Froehlke (Truman Dam), supra note 94, 368 F. Supp. at 240.

100) Id.

101) Id.

102) 510 F.2d 813, 5 ELR 20249 (5th Cir., 1975).

103) Id., 5 ELR at 20252.

104) Id.

105) 458 F.2d 827, 2 ELR 20029 (D.C. Cir., 1972).

106) Sierra Club v. Froehlke, 3 ELR 20248, 20285 (S.D. Tex., 1973). See Appendix B. The court stated, "Consideration should be given to the use of environmental matrix analysis...."

107) Natural Resources Defense Council v. Morton, supra note 105.

108) Id., 2 ELR at 20034.

109) Id.

110) Id., 2 ELR at 20033.

111) See Rodgers, supra note 14, page 794.

112) Natural Resources Defense Council v. Morton, supra note 105, 2 ELR at 20033.

113) Akers v. Resor, supra note 45, 3 ELR at 20159.

114) See Rodgers, supra note 14, page 795.

115) Id.

116) Environmental Defense Fund v. Tennessee Valley Authority (Tellico Dam), supra note 74, 4 ELR at 20121. See also Environmental Defense Fund v. Corps of Engineers (Gillham Dam), supra note 28.

117) Environmental Defense Fund v. Tennessee Valley Authority (Tellico Dam), supra note 74, 4 ELR at 20123.

118) Cape Henry Bird Club v. Laird (Gathright Dam), supra note 23, 3 ELR at 20578.

119) Id.

120) National Wildlife Federation v. Andrus (Navajo Dam), supra note 48, 7 ELR at 20530.

121) Indiana & Michigan Electric Company v. FPC, 502 F.2d 336, 339 (D.C. Cir., 1974).

122) Vermont Yankee Nuc_ear Power Corporation v. Natural Resources Defense Council, 46 U.S.L.W. 4301, 8 ELR 20288, 20295 (U.S., 1978).

123) Id., 8 ELR at 20296-97.

124) William W. Hill, "The National Environmental Policy Act and Federal Water Resources Planning: Effects and Effectiveness in the Corps and SCS," (Stanford University Department of Civil Engineering, Program in Infrastructure Planning and Management, Report IPM-4, December, 1977), page 224.

125) Id., page 148.

126) See, e.g., Environmental Defense Fund v. Corps of Engineers (Tennessee-Tombigbee Waterway), supra note 22, Environmental Defense Fund v. Corps of Engineers (Gillham Dam), supra note 28, and Minnesota Public Interest Group v. Butz, supra note 89.

127) Most often, the deficiencies are the result of failure to respond to outside comments or to represent in reasonable fashion the existence of a controversy over impacts and methods. See discussion in preceding sections of this report.

128) 40 C.F.R. §1502.17 (proposed), 43 Fed. Reg. 25238 (June 9, 1978). See also §1502.6, specifying that the disciplines of preparers be correlated with the scope of issues treated in the environmental impact statement.

129) Supra, note 6.

130) Id., §9(d).

131) Id., §9(g)(1).

132) Id., §9.

133) Id., §9(g)(3).

134) Id., App. C. §4(F)(1).

135) Id., §9(g)(4).

136) ER 1105-2-200 (10 Nov., 1975).

137) Id., §8(a)(1).

138) Id., §9(d). See also ER 1105-2-230 (10 Nov., 1975), §7(e).

139) ER 1105-2-240 (10 Nov., 1975).

140) Id., §9(b).

141) See, e.g., Akers v. Resor, supra note 45. In fairness, it should be noted that many terse judicial criticisms were directed at "first generation" impact statements produced by inexperienced planners. Judicial terseness and criticism of impact statements may also have been the product of agencies' legal efforts to minimize the analytical burdens NEPA placed upon them.

142) But it would be presumptuous for the author of this report to declare this will never happen!

143) There are eleven judicial circuits served by 97 appellate judges and 27 judicial districts served by 537 district judges. The circuits sometimes differ in interpretation of NEPA. The decisions of the circuits tend to carry more weight than the decisions of the district courts. This paper has been designed to sensitize decisionmakers to the principal concerns of the federal judiciary. The generalizations here are based on the leading circuit decisions and on oft-cited district court decisions (particularly the district court decisions involving Gillham Dam, Tellico Dam, the Tennessee-Tombigbee Waterway, Truman Dam, New Melones Dam, and Gathright Dam). Some of the district court cases used for illustrative purposes (e.g., those involving the Rouge River Project, Palmetto Bend Project, and Navajo Dam) are not widely cited, but they do reflect particular applications of general judicial concerns. The outcome in any NEPA litigation is likely to be influenced by the personal values of the federal judge involved, the attitudes and skills of the plaintiffs and defendants, and the stakes in the case.

APPENDIX A: THE NATIONAL ENVIRONMENTAL POLICY ACT OF 1969

National Environmental Policy Act of 1969, as amended
42 U.S.C. §§4321-4361

Sec.

§4321. [NEPA §2]
Congressional declaration of purpose

The purposes of this chapter are: To declare a national policy which will encourage productive and enjoyable harmony between man and his environment; to promote efforts which will prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of man; to enrich the understanding of the ecological systems and natural resources important to the Nation; and to establish a Council on Environmental Quality.

Pub. L. 91-190, §2, Jan. 1, 1970, 83 Stat. 852.

Short Title. Section 1 of Pub. L. 91-190 provided: "That this Act [enacting this chapter] may be cited as the 'National Environmental Policy Act of 1969'."

Subchapter I—Policies and Goals

§4331. [NEPA §101]
Congressional declaration of national environmental policy

(a) The Congress, recognizing the profound impact of man's activity on the interrelations of all components of the natural environment, particularly the profound influences of population growth, high-density urbanization, industrial expansion, resource exploitation, and new and expanding technological advances and recognizing further the critical importance of restoring and maintaining environmental quality to the overall welfare and development of man, declares that it is the continuing policy of the Federal Government, in cooperation with State and local governments, and other concerned public and private organizations, to use all practicable means and measures, including financial and technical assistance, in a manner calculated to foster and promote the general welfare, to create and maintain conditions under which man and nature can exist in productive harmony, and fulfill the social, economic, and other requirements of present and future generations of Americans.

(b) In order to carry out the policy set forth in this chapter, it is the continuing responsibility of the Federal Government to use all practicable means, consistent with other essential considerations of national policy, to improve and coordinate Federal plans, functions, programs, and resources to the end that the Nation may—

(1) fulfill the responsibilities of each generation as trustee of the environment for succeeding generations;

(2) assure for all Americans safe, healthful, productive, and esthetically and culturally pleasing surroundings;

(3) attain the widest range of beneficial uses of the environment without degradation, risk to health or safety, or other undesirable and unintended consequences;

(4) preserve important historic, cultural, and natural aspects of our national heritage, and maintain, wherever possible, an environment which supports diversity and variety of individual choice;

(5) achieve a balance between population and resource use which will permit high standards of living and a wide sharing of life's amenities; and

(6) enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources.

(c) The Congress recognizes that each person should enjoy a healthful environment and that each person has a responsibility to contribute to the preservation and enhancement of the environment.

Pub. L. 91-190, Title I, § 101, Jan. 1, 1970, 83 Stat. 852.

Commission on Population Growth and the American Future. Pub. L. 91-213, Mar. 16, 1970, 84 Stat. 67, provided:

"That the Commission on Population Growth and the American Future is hereby established to conduct and sponsor such studies and research and make such recommendations as may be necessary to provide information and education to all levels of government in the United States, and to our people regarding a broad range of problems associated with population growth and their implications for America's future.

"**Membership of Commission**

"Sec. 2. (a) The Commission on Population Growth and the American Future (hereinafter referred to as the 'Commission') shall be composed of—

"(1) two Members of the Senate who shall be members of different political parties and who shall be appointed by the President of the Senate;

"(2) two Members of the House of Representatives who shall be members of different political parties and who shall be appointed by the Speaker of the House of Representatives; and

"(3) not to exceed twenty members appointed by the President.

"(b) The President shall designate one of the members to serve as Chairman and one to serve as Vice Chairman of the Commission.

"(c) The majority of the members of the Commission shall constitute a quorum, but a lesser number may conduct hearings.

"**Compensation of Members of the Commission**

"Sec. 3. (a) Members of the Commission who are officers or full-time employees of the United States shall serve without compensation in addition to that received for their services as officers or employees of the United States.

"(b) Members of the Commission who are not officers or full-time employees of the United States shall each receive $100 per diem when engaged in the actual performance of duties vested in the Commission.

"(c) All members of the Commission shall be allowed travel expense, including per diem in lieu of subsistence, as authorized by section 5703 of title 5 of the United States Code [section 5703 of Title 5] for persons in the Government service employed intermittently.

"**Duties of the Commission**

"Sec. 4. The Commission shall conduct an inquiry into the following aspects of population growth in the United States and its foreseeable social consequences:

"(1) the probable course of population growth, internal migration, and related demographic developments between now and the year 2000;

"(2) the resources in the public sector of the economy that will be required to deal with the anticipated growth in population;

"(3) the ways in which population growth may affect the activities of Federal, State and local government;

"(4) the impact of population growth on environmental pollution and on the depletion of natural resources; and

"(5) the various means appropriate to the ethical values, and principles of this society by which our Nation can achieve a population level properly suited for its environmental, natural resources, and other needs.

"**Staff of the Commission**

"Sec. 5. (a) The Commission shall appoint an Executive Director and such other personnel as the Commission deems necessary without regard to the provisions of title 5 of the United States Code [Title 5] governing appointments in the competitive service and shall fix the compensation of such personnel without regard to the provisions of chapter 51 and subtitle II of chapter 53 of such title [sections 5101 et seq. and 5311 et seq. of Title 5] relating to classification and General Schedule pay rates: *Provided*, That no personnel so appointed shall receive compensation in excess of the rate authorized for GS 18 by section 5332 of such title [section 5332 of Title 5].

"(b) The Executive Director, with the approval of the Commission, is authorized to obtain services in accordance with the provisions of section 3109 of title 5 of the United States Code [section 3109 of Title 5], but at rates for individuals not to exceed the per diem equivalent of the rate authorized for GS 18 by section 5332 of such title [section 5332 of Title 5].

"(c) The Commission is authorized to enter into contracts with public agencies, private firms, institutions, and individuals for the conduct of research and surveys, the preparation of reports, and other activities necessary to the discharge of its duties.

"**Government Agency Cooperation**

"Sec. 6. The Commission is authorized to request from any Federal department or agency any information and assistance it deems necessary to carry out its functions, and each such department or agency is authorized to cooperate with the Commission and, to the extent permitted by law, to furnish such information and assistance to the Commission upon request made by the Chairman or any other member when acting as Chairman.

"**Administrative Services**

"Sec. 7. The General Services Administration shall provide administrative services for the Commission on a reimbursable basis.

"**Reports of Commission; Termination**

"Sec. 8. In order that the President and the Congress may be kept advised of the progress of its work, the Commission shall, from time to time, report to the President and the Congress such significant findings and recommendations as it deems advisable. The Commission shall submit an interim report to the President and the Congress one year after it is established and shall submit its final report two years after the enactment of this Act [Mar. 16, 1970]. The Commission shall cease to exist sixty days after the date of the submission of its final report.

"**Authorization of Appropriations**

"Sec. 9. There are hereby authorized to be appropriated, out of any money in the Treasury not otherwise appropriated, such amounts as may be necessary to carry out the provisions of this Act."

§4332. [NEPA §102]

Cooperation of agencies; reports; availability of information; recommendations; international and national coordination of efforts

The Congress authorizes and directs that, to the fullest extent possible: (1) the policies, regulations, and public laws of the United States shall be interpreted and administered in accordance with the policies set forth in this chapter, and (2) all agencies of the Federal Government shall—

(A) utilize a systematic, interdisciplinary approach which will insure the integrated use of the natural and social sciences and the environmental design arts in planning and in decisionmaking which may have an impact on man's environment;

(B) identify and develop methods and procedures, in consultation with the Council on Environmental Quality established by subchapter II of this chapter, which will insure that presently unquantified environmental amenities and values may be given appropriate consideration in decisionmaking along with economic and technical considerations;

(C) include in every recommendation or report on proposals for legislation and other major Federal actions significantly affecting the quality of the human environment, a detailed statement by the responsible official on—

(i) the environmental impact of the proposed action,

(ii) any adverse environmental effects which cannot be avoided should the proposal be implemented,

(iii) alternatives to the proposed action,

(iv) the relationship between local short-term uses of man's environment and the maintenance and enhancement of long-term productivity, and

(v) any irreversible and irretrievable commitments of resources which would be involved in the proposed action should it be implemented.

Prior to making any detailed statement, the responsible Federal official shall consult with and obtain the comments of any Federal agency which has jurisdiction by law or special expertise with respect to any environmental impact involved. Copies of such statement and the comments and views of the appropriate Federal, State, and local agencies, which are authorized to develop and enforce environmental standards, shall be made available to the President, the Council on Environmental Quality, and to the public as provided by Section 552 of Title 5, and shall accompany the proposal through the existing agency review processes;

(D) Any detailed statement required under subparagraph (C) after January 1, 1970, for any major Federal action funded under a program of grants to States shall not be deemed to be legally insufficient solely by reason of having been prepared by a State agency or official, if:

(i) the State agency or official has statewide jurisdiction and has the responsibility for such action,

(ii) the responsible Federal official furnishes guidance and participates in such preparation,

(iii) the responsible Federal official independently evaluates such statement prior to its approval and adoption, and

(iv) after January 1, 1976, the responsible Federal official provides early notification to, and solicits the views of, any other State or any Federal land management entity of any action or any alternative thereto which may have significant impacts upon such State or affected Federal land management entity and, if there is any disagreement on such impacts, prepares a written assessment of such impacts and views for incorporation into such detailed statement.

The procedures in this subparagraph shall not relieve the Federal official of his responsibilities for the scope, objectivity, and content of the entire statement or of any other responsibility under this chapter, and further, this subparagraph does not affect the legal sufficiency of statements prepared by State agencies with less than statewide jurisdiction.

(E) study, develop, and describe appropriate alternatives to recommend courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources;

(F) recognize the worldwide and long-range character of environmental problems and, where consistent with the foreign policy of the United States, lend appropriate support to initiatives, resolutions, and programs designed to maximize international cooperation in anticipating and preventing a decline in the quality of mankind's world environment;

(G) make available to States, counties, municipalities, institutions, and individuals, advice and information useful in restoring, maintaining, and enhancing the quality of the environment;

(H) initiate and utilize ecological information in the planning and development of resource-oriented projects; and

(I) assist the Council on Environmental Quality established by subchapter II of this chapter.

Pub. L. 91-190, Title I, §102, Jan. 1, 1970, 83 Stat. 853; Pub. L. 94-83, Aug. 9, 1975, 89 Stat. 424.

1975 Amendment. Subpar. (D). Pub. L. 94-83 added subpar. (D). Former subpar. (D) redesignated (E).

Subpars. (E) to (I). Pub. L. 94-83 redesignated former subpars. (D) to (H) as (E) to (I).

§4333. [NEPA §103]

Conformity of administrative procedures to national environmental policy

All agencies of the Federal Government shall review their present statutory authority, administrative regulations, and current policies and procedures for the purpose of determining whether there are any deficiencies or inconsistencies therein which prohibit full compliance with the purposes and provisions of this chapter and shall propose to the president not later than July 1, 1971, such measures as may be necessary to bring their authority and policies into conformity with the intent, purposes, and procedures set forth in this chapter.

Pub. L. 91-190, Title I, §103, Jan. 1, 1970, 83 Stat. 854.

§4334. [NEPA §104]

Other statutory obligations of agencies

Nothing in section 4332 or 4333 of this title shall in any way affect the specific statutory obligations of any Federal agency (1) to comply with criteria or standards of environmental quality, (2) to coordinate or consult with any other Federal or State agency, or (3) to act, or refrain from acting contingent upon the recommendations or certification of any other Federal or State agency.

Pub. L. 91-190, Title I, §104, Jan. 1, 1970, 83 Stat. 854.

§4335. [NEPA §105]

Efforts supplemental to existing authorizations

The policies and goals set forth in this chapter are supplementary to those set forth in existing authorizations of Federal agencies.

Pub. L. 91-190, Title I, §105, Jan. 1, 1970, 83 Stat. 854.

Subchapter II—Council on Environmental Quality

§4341. [NEPA §201]

Reports to Congress; recommendations for legislation

The President shall transmit to the Congress annually beginning July 1, 1970, an Environmental Quality Report (hereinafter referred to as the "report") which shall set forth (1) the status and condition of the major natural, man-made, or altered environmental classes of the Nation, including, but not limited to, the air, the aquatic, including marine, estuarine, and fresh water, and the terrestrial environment, including, but not limited to, the forest, dryland, wetland, range, urban, suburban, and rural environment; (2) current and foreseeable trends in the quality, management, and utilization of such environments and the effects of those trends on the social, economic, and other requirements of the Nation; (3) the adequacy of available natural resources for fulfilling human and economic requirements of the Nation in the light of expected population pressures; (4) a review of the programs and activities (including regulatory activities) of the Federal Government, the State and local governments, and nongovernmental entities or individuals, with particular reference to their effect on the environment and on the conservation, development, and utilization of natural resources; and (5) a program for remedying the deficiencies of existing programs and activities, together with recommendations for legislation.

Pub. L. 91-190, Title II, §201, Jan. 1, 1970, 83 Stat. 854.

§4342. [NEPA §202]
Establishment; membership; Chairman; appointments

There is created in the Executive Office of the President a Council on Environmental Quality (hereinafter referred to as the "Council"). The Council shall be composed of three members who shall be appointed by the President to serve at his pleasure, by and with the advice and consent of the Senate. The President shall designate one of the members of the Council to serve as Chairman. Each member shall be a person who, as a result of his training, experience, and attainments, is exceptionally well qualified to analyze and interpret environmental trends and information of all kinds; to appraise programs and activities of the Federal Government in the light of the policy set forth in subchapter I of this chapter; to be conscious of and responsible to the scientific, economic, social, esthetic, and cultural needs and interests of the Nation; and to formulate and recommend national policies to promote the improvement of the quality of the environment.

Pub. L. 91-190, Title II, §202, Jan. 1, 1970, 83 Stat. 854.

§4343. [NEPA §203]
Employment of personnel, experts, and consultants

(a) The Council may employ such officers and employees as may be necessary to carry out its functions under this chapter. In addition, the Council may employ and fix the compensation of such experts and consultants as may be necessary for the carrying out of its functions under this chapter, in accordance with section 3109 of Title 5 (but without regard to the last sentence thereof).

(b) Notwithstanding section 665(b) of Title 31, the Council may accept and employ voluntary and uncompensated services in furtherance of the purposes of the Council.

Pub. L. 91-190, Title II, §202, Jan. 1, 1970, 83 Stat. 854; Pub. L. 94-52, §2, July 3, 1975, 89 Stat. 258.

1975 Amendment. Pub. L. 94-52 designated existing provisions as subsec. (a) and added subsec. (b).

§4344. [NEPA §204]
Duties and functions

It shall be the duty and function of the Council

(1) to assist and advise the President in the preparation of the Environmental Quality Report required by section 4341 of this title;

(2) to gather timely and authoritative information concerning the conditions and trends in the quality of the environment both current and prospective, to analyze and interpret such information for the purpose of determining whether such conditions and trends are interfering, or are likely to interfere, with the achievement of the policy set forth in subchapter I of this chapter, and to compile and submit to the President studies relating to such conditions and trends;

(3) to review and appraise the various programs and activities of the Federal Government in the light of the policy set forth in subchapter I of this chapter for the purpose of determining the extent to which such programs and activities are contributing to the achievement of such policy, and to make recommendations to the President with respect thereto;

(4) to develop and recommend to the President national policies to foster and promote the improvement of environmental quality to meet the conservation, social, economic, health, and other requirements and goals of the Nation;

(5) to conduct investigations, studies, surveys, research, and analyses relating to ecological systems and environmental quality;

(6) to document and define changes in the natural environment, including the plant and animal systems, and to accumulate necessary data and other information for a continuing analysis of these changes or trends and an interpretation of their underlying causes;

(7) to report at least once each year to the President on the state and condition of the environment; and

(8) to make and furnish such studies, reports thereon, and recommendations with respect to matters of policy and legislation as the President may request.

Pub. L. 91-190, Title II, §204, Jan. 1, 1970, 83 Stat. 855.

§4345. [NEPA §205]
Consultation with the Citizens' Advisory Committee on Environmental Quality and other representatives

In exercising its powers, functions, and duties under this chapter the Council shall—

(1) consult with the Citizens' Advisory Committee on Environmental Quality established by Executive Order numbered 11472, dated May 29, 1969, and with such representatives of science, industry, agriculture, labor conservation organizations, State and local governments, and other groups, as it deems advisable; and

(2) utilize, to the fullest extent possible, the services, facilities, and information (including statistical information) of public and private agencies and organizations, and individuals, in order that duplication of effort and expense may be avoided, thus assuring that the Council's activities will not unnecessarily overlap or conflict with similar activities authorized by law and performed by established agencies.

Pub. L. 91-190, Title II, §205, Jan. 1, 1970, 83 Stat. 855.

§4346. [NEPA §206]
Tenure and compensation of members

Members of the Council shall serve full time and the Chairman of the Council shall be compensated at the rate provided for Level II of the Executive Schedule Pay Rates. The other members of the Council shall be compensated at the rate provided for Level IV of the Executive Schedule Pay Rates.

Pub. L. 91-190, Title II, §206, Jan. 1, 1970, 83 Stat. 856.

So in original.

§4346a. [NEPA §207]
Travel reimbursement by private organizations and Federal, State, and local governments

The Council may accept reimbursements from any private nonprofit organization or from any department, agency, or instrumentality of the Federal Government, any State, or local government, for the reasonable travel expenses incurred by an officer or employee of the Council in connection with his attendance at any conference, seminar, or similar meeting conducted for the benefit of the Council.

Pub. L. 91-190, Title II, §207, as added Pub. L. 94-52, §3, July 3, 1975, 89 Stat. 258.

§4346b. [NEPA §208]
Expenditures in support of international activities

The Council may make expenditures in support of its international activities, including expenditures for: (1) international travel; (2) activities in implementation of international agreements; and (3) the support of international exchange programs in the United States and in foreign countries.

Pub. L. 91-190, Title II, §208, as added Pub. L. 94-52, §3, July 3, 1975, 89 Stat. 258.

§4347. [NEPA §209]
Authorization of appropriations

There are authorized to be appropriated to carry out the provisions of this chapter not to exceed $300,000 for fiscal year 1970, $700,000 for fiscal year 1971, and $1,000,000 for each fiscal year thereafter.

Pub. L. 91-190, Title II, §209, formerly 207, Jan. 1, 1970, 83 Stat. 856; as redesignated by Pub. L. 94-52, §3, July 3, 1975, 89 Stat. 258.

Subchapter III—Miscellaneous Provisions

§4361.
Plan for research, development, and demonstration

The Administrator of the Environmental Protection Agency shall transmit to the Congress, within 6 months after October 11, 1976, a comprehensive 5-year plan for environmental research, development, and demonstration. This plan shall be appropriately revised annually, and such revisions shall be transmitted to the Congress no later than two weeks after the President submits his annual budget to the Congress in such year.

Pub. L. 94-475, §5, Oct. 11, 1976, 90 Stat. 2071.

Codification. Section was enacted as part of the Environmental Research, Development, and Demonstration Authorization Act of 1976, Pub. L. 94-475, and not of the National Environmental Policy Act, which enacted this chapter.

ACTIVITIES & USES	CONTROLS		PHYSICAL												
	STATUTES, TREATIES, AND ORDERS	SECRETARY'S REGULATIONS	WATER QUALITY	WATER YEILDS	SOIL QUALITY	AIR QUALITY	MINERAL RESERVES	VEGETATION HEALTH & VIGOR	NATURAL SUCCESSION PROCESS	VEGETATION DIVERSITY	WILDLIFE HABITAT/POPULATION - GENERAL	WILDLIFE DIVERSITY	
SOILS													
1. PREPARE THE SOIL FOR PLANTING OR SEEDING USING MECHANICAL EQUIPMENT.			S A I M					S F I	S A I	S F D			
2. PREPARE THE SOIL FOR PLANTING OR SEEDING USING CHEMICALS TO CONTROL EXISTING VEGETATION.						S A D		S A D L F I	S A D	S F I			
3. PREPARE THE SOIL FOR PLANTING OR SEEDING USING FIRE.				S F I M				S A D L F I	S A D	S F I	L F I	L F I	
4. FERTILIZE THE SOIL AT RECREATION SITES.					S F D M			S F D M					
5. STABILIZE ERODING SOILS USING PHYSICAL STRUCTURES.			L F I M		S F D								
6. STABILIZE ERODING SOILS USING VEGETATION NOT NATIVE TO THE AREA AND NOT NATURALIZED OVER THE PAST 150 YEARS.			L F I M		S F D M					S F D M			
7. STABILIZE ERODING SOILS USING NATIVE OR NATURALIZED VEGETATION.			L F I M		S F D M								
8. DO NOT PROTECT OR REHABILITATE DETERIORATING SOILS.			L A I		L A D								
WATER LEVEL MANAGEMENT													
1. MAINTAIN EXISTING WATER CONTROL STRUCTURES.													
2. INSTALL NEW LEVEL CONTROL STRUCTURES.			S A D M	L F A D M									
3. ALL EXISTING STRUCTURES TO DETERIORATE.				L F A D									
4. REMOVE EXISTING STRUCTURES.				L F A D									
5. REPLACE EXISTING STRUCTURES.			S A D M	L F A D									

CTION

LTERATION OF NATURAL WATER LEVELS THROUGH PERMIT, LICENSE, LEASE, OR OTHER AUTHORIZATION WHICH WILL RESULT IN FLOODING F LANDS WILL NOT BE GRANTED

ESERVOIRS NOT EXCEEDING 100 ACRES IN AREA MAY BE CONTRUCTED AND MAINTAINED FOR THE TRANSPORT OF LOGS OR IN ONNECTION WITH AUTHORIZED RECREATION USE AND MAXIMUM ATER LEVELS NOT HIGHER THAN THE NORMAL HIGH WATER MARK AY BE MAINTAINED TEMPORARILY WHERE ESSENTIAL FOR LOGGING URPOSES IN THE STREAMS BETWEEN LANES.

I THE USE OF BOUNDARY WATERS, THE FOLLOWING ORDER OF RECEDENCE SHALL BE OBSERVED AND NO USE SHALL BE PERMITTED HICH TENDS MATERIALLY TO CONFLICT WITH OR RESTRAIN ANY THER USE WHICH IS GIVEN PREFERENCE OVER IT.

DOMESTIC AND SANITATION
NAVIGATION
POWER AND IRRIGATION

B

I.

ABILIZE SOILS

WAY FROM OTHER USES

EAR WATER

EXPERIENCE LEVEL

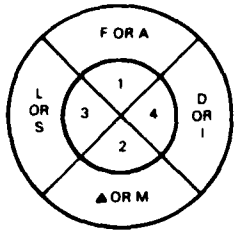
NG DAMS.

ESS THEY ARE HAZARDS.

H ARE A SAFETY HAZARD
E.

LEGEND

IMPACT DIAGRAM



CODE NOTATIONS

1. EFFECTS
   - F = FAVORABLE
   - A = ADVERSE
2. MAGNITUDE
   - = MAJOR
   - M = MINOR
3. DURATION
   - L = LONG
   - S = SHORT
4. CHARACTER
   - D = DIRECT
   - I = INDIRECT

OTHER NOTATIONS
- N = NOT COMPATIBLE
- C = COMPATIBLE
- I = INDETERMINATE

APPENDIX B: NEPA-BASED WATER RESOURCES DEVELOPMENT LITIGATION

Akers v. Resor (West Tennessee Tributaries), 339 F. Supp. 1375, 2 ELR 20221 (W.D. Tenn., 1972), 3 ELR 20157 (W.D. Tenn., 1972), 8 ELR 20388 (W.D. Tenn., 1978)

Alabama Ex Rel Baxley v. Corps of Engineers (Luxapalila Creek Channelization), 411 F. Supp. 1261, 6 ELR 20607 (N.D. Ala., 1976)

Allison v. Froehlke (Laneport Dam), 2 ELR 20357 (W.D. Tex., 1972), Aff'd, 3 ELR 20011 (5th Cir., 1972)

Association of Northwest Steelheaders v. Corps of Engineers (Lower Granite Dam), 485 F.2d 67, 3 ELR 20807 (9th Cir., 1973)

Atchison, Topeka, and Santa Fe Ry. Co. v. Callaway (Lock & Dam 26), 382 F. Supp. 610, 5 ELR 20086 (D.D.C., 1974), Motion to dismiss denied, preliminary injunction dissolved, 431 F. Supp. 722, 7 ELR 20377 (D.D.C., 1977)

Boone v. Tillatoba Creek Drainage District (Tillatoba Creek Project), 6 ERC 2101 (N.D. Miss., 1974)

Canal Authority of Florida v. Callaway (Cross-Florida Barge Canal), 4 ELR 20259 (M.D. Fla., 1974), Rev'd and remanded, 489 F.2d 567, 4 ELR 20164 (5th Cir., 1974), Denial of injunction aff'd, 512 F.2d 670, 5 ELR 20677 (5th Cir., 1975)

Cape Henry Bird Club v. Laird (Gathright Dam), 359 F. Supp. 404, 3 ELR 20571 (W.D. Va., 1973) Aff'd, 484 F.2d 453, 3 ELR 20786 (4th Cir., 1973)

Concerned Residents of Buck Hill Falls v. Grant (Buck Hill Creek), 388 F. Supp. 394, 5 ELR 20207 (M.D. Pa., 1975), Partially vacated and remanded, 6 ELR 20527 (3rd Cir., 1976)

Conservation Council of North Carolina v. Froehlke (New Hope Dam), 340 F. Supp. 222, 2 ELR 20155 (M.D. N.C., 1972), Aff'd per curiam, 2 ELR 20259 (4th Cir., 1972), Directions to District Court, 3 ELR 20132 (4th Cir., 1973), Denying application for interlocutory appeal, 4 ELR 20062 (4th Cir., 1973), Consent judgment, 4 ELR 20529 (M.D. N.C., 1974), Dismissed, 435 F. Supp. 775, 7 ELR 20807 (M.D. N.C., 1977)

Duck River Preservation Association v. TVA (Duck River Project), 410 F. Supp. 758 (E.D. Tenn., 1974) Aff'd 529 F.2d 524 (6th Cir., 1976)

Environmental Defense Fund v. Armstrong (New Melones Dam), 2 ELR 20604 (N.D. Cal., 1972), 352 F. Supp. 50, 2 ELR 20735 (N.D. Cal., 1972), 356 F. Supp. 131, 3 ELR 20294 (N.D. Cal., 1973), Aff'd 356 F. Supp. 131, 487 F.2d 814, 4 ELR 20001 (9th Cir., 1973)

Environmental Defense Fund v. Corps of Engineers (Cross-Florida Barge Canal), 324 F. Supp. 878, 1 ELR 20079 (D.D.C., 1971)

Environmental Defense Fund v. Corps of Engineers (Gillham Dam), 325 F. Supp. 728, 749, 1 ELR 20130 (E.D. Ark., 1970-1971), 342 F. Supp. 1211, 2 ELR 20260, 2 ELR 20353 (E.D. Ark., 1972), Aff'd, 470 F.2d 289, 2 ELR 20740 (8th Cir., 1972)

Environmental Defense Fund v. Corps of Engineers (Tennessee-Tombigbee Waterway), 331 F. Supp. 925, 1 ELR 20466 (D.D.C., 1971)

Environmental Defense Fund v. Corps of Engineers (Tennessee-Tombigbee Waterway), 384 F. Supp. 916, 2 ELR 20536 (N.D. Miss., 1972), Aff'd, 496 F.2d 1123, 4 ELR 20329 (5th Cir., 1974)

Environmental Defense Fund v. Froehlke (Cache River Project), 473 F.2d 346, 3 ELR 20001 (8th Cir., 1972), On remand, 3 ELR 20519 (E.D. Ark., 1973), Dismissed sub nom Environmental Defense Fund v. Hoffman, 421 F. Supp. 1083, 7 ELR 20152 (E.D. Ark., 1976), Aff'd, 8 ELR 20056 (8th Cir., 1977)

Environmental Defense Fund v. Froehlke (Truman Dam), 348 F. Supp. 338, 2 ELR 20620 (W.D. Mo., 1972), Aff'd, 477 F.2d 1033, 3 ELR 20383 (8th Cir., 1973), 368 F. Supp. 231, 4 ELR 20062 (W.D. Mo., 1973) Aff'd per curiam sub nom Environmental Defense Fund v. Callaway, 497 F.2d 1340, 4 ELR 20686 (8th Cir., 1974)

Environmental Defense Fund v. Stamm (Central Valley Project), 6 ELR 20621 (N.D. Cal., 1976)

Environmental Defense Fund v. TVA (Duck River Dam), 3 ELR 20331 (E.D. Tenn., 1972), 3 ELR 20432 (E.D. Tenn., 1973)

Environmental Defense Fund v. TVA (Tellico Dam), 339 F. Supp. 806, 2 ELR 20044 (E.D. Tenn., 1972), Aff'd, 468 F.2d 1164, 2 ELR 20726 (6th Cir., 1972), 371 F. Supp. 1004, 4 ELR 20120 (E.D. Tenn., 1973), Aff'd per curiam, 492 F.2d 466, 4 ELR 20225 (6th Cir., 1974)

Mansfield Area Citizens Group v. United States (Tioga-Hammond Lakes), 413 F. Supp. 810 (M.D. Pa., 1976)

McPhail v. Corps of Engineers (Rouge River Project), 3 ELR 20237 (E.D. Mich., 1972)

Montgomery v. Ellis (Blue Eye Creek), 364 F. Supp. 517, 3 ELR 20845 (N.D. Ala., 1973)

National Audubon Society v. Andrus (Garrison Dam), 7 ELR 20414 (D.D.C., 1977)

National Wildlife Federation v. Andrus (Navajo Dam), 7 ELR 20526 (D.D.C., 1977)

Natural Resources Defense Council, Inc. v. Grant (Chicod Creek), 341 F. Supp. 356, 2 ELR 20185 (E.D. N.C., 1972), 2 ELR 20647 (IE.D. N.C., 1972), 2 ELR 20467 (E.D. N.C., 1972), 355 F. Supp. 280, 3 ELR 20176 (E.D. N.C., 1973)

Natural Resources Defense Council, Inc. v. Stamm (Auburn Dam), 4 ELR 20463 (E.D. Cal., 1974)

Nelson v. Butz (Knife River), 377 F. Supp. 819, 4 ELR 20840 (D. Minn., 1974)

Neuse Valley Association v. Richardson (Falls Lake Project), 3 ELR 20658 (E.D. N.C., 1973)

Ohio Ex Rel Brown v. Callaway (Caesar's Creek, Little Miami River), 364 F. Supp. 296, 3 ELR 20892 (S.D. Ohio, 1973), Aff'd in part, rev'd in part, 497 F.2d 1235, 4 ELR 20492 (6th Cir., 1974)

Robinson v. Knebel (Cane Creek), 550 F.2d 422, 7 ELR 20358 (8th Cir., 1977)

Save the Niobrara River Association v. Andrus (O'Neill Unit), 10 ERC 1665 (D. Neb., 1977)

Save Our Invaluable Land, Inc. v. Needham (Hillsdale Dam), 542 F.2d 539, 6 ELR 20800 (10th Cir., 1976)

Sierra Club v. Froehlke (Meramec Park Dam and Reservoir Project), 3 ELR 20724 (E.D. Mo., 1973), 392 F. Supp. 130, 5 ELR 20456 (E.D. Mo., 1975), Aff'd, 534 F.2d 1289, 6 ELR 20448 (8th Cir., 1976)

Sierra Club v. Froehlke (Kickapoo River-LaFarge Lake Project), 345 F. Supp. 440, 2 ELR 20307 (W.D. Wis., 1972), Aff'd, 3 ELR 20823 (7th Cir., 1973)

Sierra Club v. Froehlke (Wallisville Dam Project, Trinity River Project), 359 F. Supp. 1289, 3 ELR 20248 (S.D. Tex., 1973), Rev'd and remanded sub nom Sierra Club v. Callaway, 499 F.2d 982, 4 ELR 20731) (5th Cir., 197[illegible])

Sierra Club v. Laird (Gila River), 1 ELR 20085 (D. Ariz., 1971)

Sierra Club v. Morton (Palmetto Bend Project), 10 ERC 1467 (S.D. Tex., 1975)

Sierra Club v. Resor (Kickapoo River Project), 329 F. Supp. 890, 1 ELR 20366 (W.D. Wis., 1971)

Sierra Club v. Stamm (Strawberry Aqueduct and Collection System), 507 F.2d 788, 5 ELR 20209 (10th Cir., 1974)

Simmans v. Grant (Big Creek Slough), 370 F. Supp. 5, 4 ELR 20197 (S.D. Tex., 1974)

Texas Committee on Natural Resources v. Resor (Cooper Dam), 1 ELR 20466 (E.D. Tex., 1971)

Trout Unlimited v. Morton (Teton Dam), 509 F.2d 1276, 5 ELR 20151 (9th Cir., 1974)

United Family Farmers, Inc. v. Kleppe (Oahe Project), 418 F. Supp. 591, 6 ELR 20758 (D.S.D., 1976), Aff'd, 552 F.2d 823, 7 ELR 20340 (8th Cir., 1977)

United States v. 247.37 Acres of Land, 1 ELR 20513 (S.D. Ohio, 1971), Motion denied, 2 ELR 20514 (S.D. Ohio, 1972)

Upper West Fork River Watershed Ass'n v. Corps of Engineers (Stonewall Jackson Lake). 414 F. Supp. 908, 6 ELR 20580 (N.D. W.Va., 1976), Aff'd, 556 F.2d 576, 7 ELR 20444 (4th Cir., 1977)

Warm Springs Dam Task Force v. Gribble (Warm Springs Dam), 378 F. Supp. 240, 4 ELR 20661 (N.D. Cal., 1974), Order stayed pending appeal, 417 U.S. 1301, 4 ELR 20666 (Douglas, J., Cir. Justice, 1974), Stay aff'd per curiam, 418 U.S. 910, 4 ELR 20679 (U.S., 1974), Motion for permanent injunction denied, 431 F. Supp. 320, 7 ELR 20612 (N.D. Cal., 1977), Aff'd, 8 ELR 20285 (9th Cir., 1977)

APPENDIX C: BOUNDARY WATERS CANOE AREA ENVIRONMENTAL IMPACT STATEMENT (EXCERPTS)

Source: Forest Service, U. S. Department of Agriculture, "Boundary Waters Canoe Area Management Plan and Environmental Statement," (USDA-FS-R9-FES-Adm-74-1, June 28, 1974)

IV. ENVIRONMENTAL IMPACTS

A. INTRODUCTION

The development of Land Use Management Plans requires an analysis of the potential effects various activities and uses would have on the environment. Once it is decided to permit certain activities or uses, implementing policies are written into the Land Use Plan that will mitigate some or all of the adverse effects. This Chapter is an Environmental Analysis of the potential impacts of activities and uses existing or suggested for the BWCA.

The "heart" of this chapter is the environmental analysis display.

Which enables the reader to view:

1. The potential effect (favorable or adverse) of a single activity or use on a particular environmental factor (each cell in the matrix).
2. The potential cumulative effect of a single activity or use on all environmental factors (reading the display horizontally).
3. The potential cumulative effect of all activities and uses on a single environmental factor (reading the display vertically).
4. Management Direction as set forth in the laws regulating the area.
5. Opportunities for mitigating major adverse effects of groups of activities.

In studying this exhibit, it is important to keep in mind what it <u>is</u>, and what it is <u>not</u>.

---It <u>is</u> a list of potential effects of activities and uses as evaluated by specialists in soil, hydrology, forestry, landscape architecture, economics and wildlife and is based on their experiences, collective opinions and understanding of the various environmental factors.

---It is <u>not</u> "the last word" regarding impacts or effects but a guide as to what might happen.

For such a large and diverse area, it was impossible to predict exactly what the impacts of an activity would be. However, in order to determine what activities should be allowed, and how they should be constrained, it was necessary to predict as well as possible what impacts and effects could occur, so that policies could be developed to avoid the adverse ones, despite the lack of precise definition.

B. THE PARTS OF THE ENVIRONMENTAL ANALYSIS DISPLAY

1. Activities and Uses

The Activities and Uses appear in the left hand column and are mostly self-explanatory. Included are activities that can have impacts, either by correcting a problem or causing one. For example, most of the activities under "soil" are undertaken to repair or prevent erosion and loss of water quality, but could, when being performed, disrupt another factor such as wildlife. Also, "no action" for a given program is set forth as a possible activity when this appears to be a rational alternative.

2. Controls

a. Statutes, Treaties & Orders

This column summarizes the extent to which a given activity is constrained by significant legislation affecting the BWCA. The abbreviations represent the following acts, treaties, and orders:

W.A. - Wilderness Act (1964)
R.B. - Root-Bryce Treaty (1909)
S.N.N. - Shipstead-Newton-Nolan Act (1930)
Org. - Forest Service Organic Act (1897)
End. Spec. - Endangered Species Act (1973)
E.O. 11644 - Executive Order (Nixon) regarding off-road vehicles
WEB. - Webster-Ashburton Treaty (1842)
E.O. 10092 - Executive Order (Truman) regarding airplanes (1949)
N.H.P.A. - National Historic Preservation Act (1966)

b. Secretary's Regulation

Summarizes the activities mentioned by the 1965 Secretary of Agriculture's BWCA Regulation, and whether they are limited or prohibited.

3. Environmental Factors

Most of the remaining columns are devoted to the important environmental factors in the BWCA that are susceptible to change. A summary near the end of the chapter explains the factors and some of their characteristics that can be affected.

4. Management Direction

Many laws passed by Congress set the framework by which National Forest land is administered. Those that principally relate to the BWCA (outlined in Chapter II) are the source documents for the Management Direction Statements appearing in the upper right block of the display matrix.

This direction influences the selection of uses and activities to be permitted in the BWCA and prescribes certain controls over them.

5. Mitigation

In the Mitigation column directly below Management Direction are the most obvious measures that can be taken to mitigate adverse effects. These remarks, Management Direction and the analysis essentially tell the manager what to watch for or guard against in selecting uses and writing control policies in a Land Use Management Plan. In Section C of this Chapter, directly following the Matrices, there is a general discussion of each of the environmental factors and a summary of how adverse effects can be prevented or arrested.

It is realized that certain activities undertaken to mitigate some undesirable conditions could in turn cause other adverse effects. For instance, equipment use or construction to stabilize soils can generate noise or affect the natural appearance of the landscape, making further mitigation necessary and must be reckoned with when developing management policies.

APPENDIX D: OCS OIL AND GAS LEASING ENVIRONMENTAL IMPACT STATEMENT (EXCERPTS)

Source: Bureau of Land Management, Department of the Interior, "Final Environmental Statement for a Proposed 1973 Outer Continental Shelf Oil and Gas General Lease Sale, Offshore Mississippi, Alabama and Florida, OCS Sale No. 32, FES 73-60, (Volume 2)," (October 17, 1973).

I. A Matrix Analysis of Some Possible Adverse Impacts on the Environment and Related Uses

In this section, a matrix system is introduced for the purpose of identifying and analyzing on a tract-by-tract basis those factors resulting from the proposed sale which could impact on the environment and which lend themselves to such an analysis. The matrix itself is simply a device used for displaying the interrelationships of some of the impact-producing factors (on the horizontal axis of each matrix) with coastal activities and resources which could sustain an impact (on the vertical axis of each matrix) and for assigning values to these interrelationships.

1. Purpose - The purpose is to analyze some of the possible impacts of the proposed OCS lease sale on the environment using a matrix analytical technique in an attempt to provide the decision-maker and reviewer with an array of factors which must be considered in order to form value judgments concerning the importance of these impacts to the environment.

2. Significant Resource Factors - The matrix analysis examines major factors which could sustain negative impacts as a result of the development of the tracts included in the proposed lease sale. Significant resource factors appear on the vertical axis of each matrix and for purposes of this analysis have been identified and placed into two groups as follows:

a. Natural Resource System

Refuges/wildlife management areas 1/

Unique and highly productive area 2/

Biota seaward of estuary/nursery areas

Beaches

b. Coastal Activities/Multiple Uses

Shipping

Recreaction (boating, swimming, water oriented activities other than sport fishing)

1/ Includes parks, sanctuaries, historical landmarks, etc.

2/ Includes marsh, estuary, and nursery areas.

Commercial fishing

Sport fishing

Ordnance Disposal Areas 1/

3. Impact-Producing Factors - The matrix includes two major categories of factors which can impact on significant resources (i.e., natural resource systems, and coastal activities) as a result of the development of proposed OCS oil and gas leases. The Impact-Producing Factors appear on the horizontal axis of each matrix and have been identified as follows:

a. Structures (e.g., platforms, fixed structures and artificial islands)

b. Oil spills

Other impact-producing factors such as debris and pipeline construction cannot be analyzed on a tract-by-tract basis and therefore are not included in this matrix section. However, these and other factors were discussed on the basis of the entire sale earlier in the statement.

4. Analytic Procedures - Each impact-producing factor is analyzed on the basis of (A) its potential magnitude and persistence which we have termed its importance, and (B) its proximity to high value resources or coastal activities/multiple-uses. A series of scales have been devised for the purpose of assigning a range of values consisting of importance and proximity to each impact-producing factor. These scales together with definitions and discussions are presented below.

(A) IMPORTANCE

a. Structures:

Under some conditions, offshore structures have an adverse effect on

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1/ The reviewer should be aware of the caveat that some level of hazard due to interference with military training and testing activities exist for 35 tracts in the Pensacola South No. 1 area. However, detailed and precise data concerning the nature and scope of this hazard is needed in order to analyze it in the matrix context. These data are not available at this time (see section III. F.). Therefore, final judgment concerning the potential harm these tracts pose to the environment can not be made at this time, but in the interest of safety they are considered hazardous (see section III. K. 1.).

commercial fishing activities. Depending on currents and underwater obstacles an offshore structure can remove areas of trawling and purse seining waters. Heavy concentrations of platforms can make trawling and purse seining difficult.

Oil and gas platforms pose a hazard to commercial fishing and boating in general. Directional drilling from outside shipping lanes, however, can be used to develop tracts lying partially in shipping lanes. An estimate of the importance of the impact of structures on the environment consists of two factors: 1) quantity--in this case it is estimated that all tracts 5,000 acres or more in size will average three structures per tract, even though some tracts may never be developed, and 2) time--all structures will remain on site for an average period of 15 to 20 years.

b. Oil spills:

The same two factors for estimating the importance of oil spills on the environment are as follows: 1) quantity--our analysis is based on all spills of 1,000 bbl. or more, and 2) time--based on past experience the oil itself may remain in contact with, or a hazard to, the environment for a period of 1 to 90 days.

A scale (Table 18) indicating the importance structures and oil spills pose to significant resources or coastal activities/multiple uses follows:

Table 18

SCALE OF IMPORTANCE

100 - Oil spills: complete destruction of a resource within the immediate area of a spill, impossible to remedy or control; Structures: permanent obstruction and disruption of coastal activities/ multiple uses.

80 - Oil spills: very hazardous to life and extremely difficult to remedy; Structures: very inconvenient interference with coastal activities/multiple uses.

60 - Oil spills: hazardous to plant and animal life and costly to remedy or control; Structures: inconvenient interference with coastal activities/multiple uses.

(Continued)

Table 18 (Continued)

40 - Oil spills: unsightly and potentially hazardous to plant and animal life but relatively easy to remedy or control; Structures: some minor inconvenience to coastal activities/multiple uses.

20 - Oil spills: unsightly; Structures: slight inconvenience.

0 - No adverse effect.

(B) PROXIMITY

Each tract is assigned a proximity number, based on its distance from shore or high-value resources.

A vector analysis consisting of nearshore current direction and velocity, and wind direction and velocity data in the study area would be necessary to construct an oil spill simulation model. Unfortunately, reliable and extensive nearshore surface current data are not available for the study area. However, observations of oil slicks indicate an average drift rate at approximately 3% of the surface wind speed in the direction of the wind. 1/ Therefore, this simple formula will be applied to the extensive wind data available for the Northeastern Gulf of Mexico (see Attachment F) for monthly wind patterns based on records dating back as far as 1858 for the purpose of estimating the shoreward rate of drift of an oil slick. 2/ This in turn will serve as a basis for assigning proximity values to each tract in terms of its relation to shore or high value, vulnerable resources. It should be emphasized that the estimated direction and rate of oil slick movement is an approximation of the driving force exerted upon an oil slick by the wind. It does not consider slick geometries, natural dispersive forces,

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1/ The 3% figure is an order-of-magnitude figure which, in our estimation is more representative of the open ocean than are some of the values reported in the literature pertaining to confined bays or semi-enclosed waters.

2/ A shoreward rate of drift is the single most important factor involved in estimating time and possible impact points of an oil spill on nearshore or onshore high value, vulnerable resources.

evaporation, absorption, dissolution or emulsification rates, and other forces that could cause cessation of the spreading movement of a slick.

The wind rose data in Attachment F indicates that the critical months for a possible shoreward slick movement in the New Orleans and Pensacola areas would be March, April, May and June, and in the Apalachicola area it would be June, July, August and February. An oil slick in the New Orleans area during these months would move at an estimated rate of 0.3-0.36 knots in the direction of the shore (i.e., north by northwest) at a 30-35% frequency. An oil slick in the Pensacola area during these same months would move at an estimated rate of 0.3-0.4 knots in the direction of the shore (i.e., north by northwest) at a 35-45% frequency. And, an oil slick in the Apalachicola area during the months identified above would move at an estimated rate of 0.2-0.45 knots in the direction of the shore (i.e., east by northeast) at a 15-27% frequency. The probability of an oil slick reaching shore is lower during the months of September, October, November, December and January than it is during the spring and summer months.

For purposes of analyses we have established a proximity scale which is based on the following assumptions:

a) An oil spill of 1000 bbl. or more has occurred.

b) The rate of shoreward drift of an oil spill in the study area under normal conditions is estimated at 0.3-0.5 knots. For purposes of this analysis the 0.5 knot rate is used.

c) The shoreward direction of an oil slick will occur more frequently in the spring and summer than in the fall and winter but no distinction concerning the seasonality factor will be included in the proximity scale. All tracts are considered to be in areas that could produce a shoreward drift of an oil slick at any given time should a spill occur. Although this would be least likely to occur with regard to tracts in the Tarpon Springs and Tampa area. All tracts with the possible exception of those in the Pensacola South area are considered to have an equally low probability of creating a spill.

d) A 12-hour response time is necessary to implement contingency

measures to stop or retard oil from reaching shore, or high value, vulnerable resource area. The oil industry presently has a contingency plan for containing and cleaning-up oil spilled in Federal areas of the OCS offshore Louisiana and Texas which meets this response time capability. However, the present capability when extended to the area offshore Mississippi, Alabama and Florida would require a response time of 48 hours. This is considered inadequate. Therefore a special stipulation requiring equipment to be available so as to allow for a 12-hour response time has been recommended (see section IV. D.).

Based on these assumptions each tract is assigned a proximity number based on the following scale (Table 19):

Table 19

Proximity Scale (Oil Spills)

1.0 - Tract is within 7.0 statute miles of shore or significant resource. 1/

0.9 - Tract is within 7.1-8.0 statute miles of shore or significant resource.

0.8 - Tract is within 8.1-9.0 statute miles of shore or significant resource.

0.7 - Tract is within 9.1-11.0 statute miles of shore or significant resource.

0.6 - Tract is within 11.1-13.0 statute miles of shore or significant resource.

0.5 - Tract is within 13.1-16.0 statute miles of shore or significant resource.

0.4 - Tract is within 16.1-19.0 statute miles of shore or significant resource.

0.3 - Tract is within 19.1-23.0 statute miles of shore or significant resource.

0.2 - Tract is within 23.1-27.0 statute miles of shore or significant resource.

(Continued)

1/ A line 12 miles seaward of the shoreline, outer islands, or unique reef fishing area, where appropriate, represents the point from which proximity of tracts to intensive commercial and sport fishing activities are measured.

Table 19 (Continued)

0.1 - Tract is within 27.1-32.0 statute miles of shore or significant resource.

0-0 - Tract is within 32.1-up statute miles of shore or significant resource.

The proximity scale with regard to structures takes into account their potential impact on shipping and their location in relation to unexplored munitions dumping area. This scale is different than that for oil spills, as shown below (Table 20).

Table 20

Proximity Scale (Structures)*

1.0 - Tract partially within shipping lane, anchorage area, natural resource system, activity or dumping area.

0.8 - Tract within one mile of shipping lane, anchorage area, natural resource system, activity or dumping area.

0.6 - Tract within 1.1-3 miles of shipping lane, anchorage area, natural resource system, activity or dumping area. 1/

0.4 - Tract within 3.1-6 miles of shipping lane, anchorage area, natural resource system, activity or dumping area. 2/

0.2 - Tract within 6.1-10 miles of shipping lane, anchorage area, natural resource system, activity or dumping area.

0.0 - Tract beyond 10 miles of shipping lane, anchorage area, natural resource system, activity or dumping area.

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* Measurements taken from the edge of a tract to the nearest edge of a shipping lane, anchorage area, natural resource system or activity area including unexplored munitions dumping area.

1/ Tracts ranging in depth from over 90' to 210' are considered to be in an intensive commercial fishery area for only one species, such as brown shrimp. These tracts have been assigned a value of 0.6 to reflect the fact that offshore structures in these water depths will be in proximity to an intensive single species fishery.

2/ Each proposed tract not located in an intensive commercial fishing area has been assigned a value of 0.4. This value has been assigned to reflect the fact that commercial fishing activities occur throughout the Gulf and therefore, all platforms placed on the continental shelf will be in proximity to some kind of commercial fishing activity regardless of water depth or distance from shore.

(C) RELATIVE ENVIRONMENTAL IMPACT FACTOR

A relative environmental impact factor is a product of Importance, and Proximity, and is expressed both for structures, F (St) and oil spills, F (O.S.). The equation for obtaining this factor can be expressed simply as I × P = F (St. or O.S.).

The higher the relative environmental impact factor, the higher the potential for environmental damage. Tracts with overall high environmental indices will be singled out for additional consideration in accordance with the scale below. It is very important for the decision-maker or reviewer to keep in mind the possible synergistic and/or accumulative effects resulting from a tract having one or more categories within a high index range.

This scale of relative environmental impact factors (Table 21) is proposed for determining the potential damage a tract might pose to a significant resource or activity.

Table 21

Relative Environmental Impact Scale

Greater than or equal to 50	Relative environmental impact factor in this range indicates that the tract should be carefully scrutinized. Depending upon the significance and character of the resource that may be affected, possibilities in the decision include: (1) Withdraw the entire tract from the proposed offering. (2) Offer only a portion of the tract. (3) Offer the tract with special stipulations included in the lease to reduce the potential for damage or hazard. (4) Offer the tract because of mitigating circumstances with or without special stipulations.
Greater than zero but less than 50	Relative environmental impact factor in this range indicates that the tract could be developed safely within existing standard practices and operating regulations without significant damage to the resource involved. Additional special stipulations in the lease would not normally be necessary.

The individual, tract-by-tract, matrices have been appended to this statement. See Attachment J. The following section presents a recapitulation of the matrices and the section following that presents a summary of risk analysis.

J. Recapitulation of the Matrices

1. Refuges/Management Areas

There are a total of six tracts (Tract Nos. 1, 2, 3, 44, 50, and 51) in this proposed sale that reflect an environmental impact factor for oil spills of 50 in relation to refuges/management areas. This reflects the fact that these tracts range from 14 to 16 miles offshore the Gulf Islands National Seashore or the Breton National Wildlife Refuge and a massive oil spill from any one of the six tracts could impact upon this area.

2. Unique and Highly Productive Areas

(Marsh, Estuary, Nursery)

There are no tracts in this sale which reflect an environmental impact factor of over 30 for oil spills or structures in relation to unique and highly productive areas. This is a result of the fact that most of the tracts are a considerable distance from estuary, marsh, nursery, or other highly productive areas.

3. Biota Seaward of Estuary/Nursery Areas -

All tracts in this proposed sale reflect an environmental impact factor of 40 for oil spills in relation to this natural resource category. Of all the categories included in the matrix analysis, the adverse impact of an oil spill on biota in the open water of the sea, is the one we know the least about. Although data in this area are sparse, some of the effects are discussed in section III of this statement.

4. Beaches -

There are no tracts in this proposed sale which have an environmental impact factor of over 40 for oil spills in relation to beaches.

5. Shipping -

There are a total of 20 tracts (Tract Nos. 2-4, 12, 14-17, 29, 31, 41-43, 47-48, 53, 55-58) in this proposed sale which have an environmental impact factor of 80 for structures in relation to

shipping. This is a reflection of the fact that each of these tracts are partially within shipping safety lanes. Two of these tracts (Nos. 3 and 47) lie partially within two safety lanes where they converge. Development of these 20 tracts will be subject to Federal Regulations as described in section IV. B. of this statement.

There are an additional 8 tracts (Nos. 5, 6, 13, 20, 24, 46, 49 and 54) which have an environmental impact factor of 64 for structures in relation to shipping. This is a reflection of the fact that each of these tracts are within one mile of established safety fairways. No other tracts in this proposed sale are within one mile of shipping safety fairways.

There are no established shipping safety lanes east of the Pensacola South No. 1 area. Vessel traffic in this area of the Gulf of Mexico is scattered and, therefore, no determination can be made concerning the proximity of tracts proposed for offering in the Apalachicola South, Tarpon Springs and Tampa areas in relation to shipping.

6. Outdoor Recreation -

There are no tracts in this proposed sale which reflect an environmental impact factor of 50 or more under either structures or oil spills for this category.

7. Commercial Fishing -

There are a total of 39 tracts (Nos. 1-4, 44-46, 50-52 and all tracts in the Apalachicola South area) which have an environmental impact factor of 80 for both oil spills and structures in relation to commercial fishing. In addition, there are 7 tracts (Nos. 42-43, 47-49, and 53-54) which have an environmental impact factor of 80 for structures in relation to commercial fishing and 3 tracts (Nos. 5-6, and 8) which have a factor of 80 for oil spills in relation to commercial fishing. Therefore, there are a total of 49 tracts in this proposed sale which have an environmental impact factor of 80 for either oil spills, structures or both in relation to commercial fishing. Accordingly, these tracts should be carefully scrutinized as part of the decision-making process.

In addition, tract No. 42 has an environmental impact factor of 72

for oil spills in relation to commercial fishing; 3 tracts (Nos. 47, 53, and 54) have factors of 64; and, 2 tracts (Nos. 48 and 49) have factors of 56 for oil spills in relation to commercial fishing activities. This reflects the fact that the above 6 tracts are considered to be in an area whereby an oil spill from any one of them could impact upon commercial fishing activities.

A suggested stipulation concerning the development of all the tracts in this proposed sale has been presented in section IV. B. If adopted, this stipulation would help mitigate the impact resulting from the placement of structures in relation to commercial fishing activities. However, the potential adverse impact on commercial fishing activities and commercial fish species resulting from oil spills cannot be mitigated by a special stipulation.

8. Sport Fishing -

There are a total of 13 tracts (Nos. 1-6, 8, 44-46, and 50-52) which have an environmental impact factor of 80 for oil spills in relation to sport fishing activities. This is a result of the proximity of these tracts to sport fishing areas.

In every case, the environmental impact factor of structures for sport fishing is fixed at a zero. This reflects the fact that offshore structures have a favorable impact on sport fishing activities by concentrating fish around the platforms and thereby increasing the average catch. Most of the sport fishing from platforms is undertaken within 30 miles from shore, although some sport fishing craft make overnight trips and can venture out much further. Offshore platforms also serve as aids to navigation, a course of assistance in emergencies and havens for small boats in storms. Platforms resulting from blocks leased as a result of this proposed sale could be expected to have a positive and favorable impact on sport fishing and small boat recreationists over a period of time (up to 20-25 years).

9. Ordnance Disposal Areas -

There are a total of 7 tracts (Nos. 69-72, and 76-78) which have an environmental impact factor of 100 for structures in relation to ordnance disposal areas. Six of these tracts are within a known salvo

area, some or all of which harbor unexploded munitions on the ocean floor. Practice bombing is conducted on the Eglin military reserve and occasionally ordnances fail to release. When this happens established water ranges are used for jettisoning hung ordnance.

This ordnance, in the form of unexploded munitions, represents a potential hazard to any activity that involves use of the ocean floor in the disposal areas. In addition, tract No. 72 although outside the salvo areas, is in the area of an unexploded depth charge which was reported in 1956.

In addition, there are 7 tracts (Nos. 73, 79, 80, 83, 84, 85, and 86) that have an environmental impact factor of 80 for the placement of structures in relation to ordnance disposal areas. All of these tracts are outside, but adjacent to, active salvo areas or the area designated as containing an unexploded depth charge.

K. Summary Risk Analysis

Three risk categories will be used to rank the degree of potential hazard the tracts in this proposed sale pose to the environment. These categories are discussed below:

1. High Hazard Potential to the Environment

High hazardous may be defined as a tract which is oil or oil and gas prone and within such close proximity to a high value-critically vulnerable resource as to disallow the minimum present practical response time 1/ necessary to effectuate oil spill containment, clean-up and contingency measures to stop or retard the spill from impacting upon the resource. Also, a tract may be considered highly hazardous if it is oil prone and is wholly located in an unstable sediment zone.

In the draft environmental statement for this proposed sale, six tracts (Nos. 5-10) were tentatively identified as being located in an unstable sediment zone and were, accordingly, placed within the highly hazardous category. In response to this preliminary identification,

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1/ Minimum practical response time would be at least 12 to 18 hours from the time a spill occurred to the time appropriate equipment can be at the spill site.

the Shell Oil Company prepared two reports 1/ 2/ which they submitted at the public hearing held in Tallahassee, Florida, which conclude that "these tracts (Mobile South No. 1 Area, tracts 5-10) are not located in an unstable sediment zone and should not be considered as posing an abnormally high hazard potential to the environment." Six major categories of information were used by the Shell scientists to reach this conclusion concerning the bottom stability conditions in the subject tracts. These were:

1. Location, proximity of tracts to high rate deposition centers on the modern delta, indicates that the area has been relatively unaffected by the delta.
2. Bathymetry, changes in general bathymetric features of tracts in recent past indicates that the area lies outside area of bottom instability caused by delta sediments.
3. Soil Boring Data, near surface soils in area in question are much stronger than on delta with no evidence of soil movement having occurred to significant depths in recent past.
4. Geophysical Data, correlation with core holes and geological data indicates recent soil movements generally restricted to within 12-15 miles or present mouths of river passes.
5. Analytical Model Results, indicate soils in vicinity of Blocks 62 and 290 will remain stable under very severe hurricane conditions.
6. Structural Experience, indicates that soil movement accompanying a major hurricane will be restricted to recent delta sediments.

A staff geophysicist of the Geological Survey has carefully reviewed the two reports provided by Shell Oil Company and has indicated that the technical aspects of the problems are well developed and the reports present a convincing analysis of the bottom conditions in the area of interest. He also points out that Mr. Bea is a recognized authority in submarine slope stability and his work in this field is

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1/ Bea, R. G., 1973, Sea Floor Stability South Pass Block 62 and Main Pass Block 290 Areas, O.D.C. Report 47, Shell Oil Company, Offshore Division Construction, Southern E & P Region.

2/ Bea, R. G. and Bernard, H. S., 1973, Movements of Bottom Soils in the Mississippi Delta Offshore, O.D.C. Report 44, Shell Oil Company, Offshore Division-Construction, Southern E & P Region.

highly respected. Moreover, Shell has shown a keen interest in bottom stability, at least since 1969 when they lost two platforms in South Pass Block 70 as a result of soil movement triggered by Hurricane Camille. Mr. Bea has written several articles on this subject and both he and Shell Oil have been very cooperative in sharing the results of their findings in this field with the USGS.

In addition, a geophysical contractor presently conducting a high resolution geophysical survey in the area in question was contacted and he reported that he has not seen any hazardous conditions that would justify identification of the tracts reported in the DES as highly hazardous.

At this time, based on the information made available to us, we have no data or analysis that would lead us to conclude that any undue or excessive hazard due to unstable bottom conditions would be encountered during the development of these tracts. Therefore, no tracts in this proposed sale are identified as highly hazardous because of unstable sediments.

Until we receive the information requested from the Department of Defense (see Sec. III. F.), we will tentatively assume that 35 tracts in the Pensacola South No. 1 area 1/ will pose a high hazard potential to the environment. This determination is based upon the fact that the risks associated with development of the tracts in the Pensacola South No. 1 area in relation to military activities are not well understood at this time. This interpretation is tentative and subject to refinement, however, and final judgment concerning the potential harm the development of the 35 tracts might pose to the environment must await receipt of DOD's hazardous analysis. This issue will be resolved before any decision is reached concerning whether or not to proceed with the leasing of these 35 tracts.

2. Moderate Hazard Potential to the Environment

Moderately hazardous may be defined as an oil or oil and gas prone tract whose proximity to a high value-critically vulnerable resource

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1/ See Attachment C, Tract Nos. 67 through 101.

does not preclude adequate response time (based on current industry capability in the Gulf of Mexico, offshore Louisiana, and Texas which by a proposed stipulation will be required for the area of this sale too - see section IV.) necessary to effectuate containment, clean-up and contingency measures to stop or retard the spill from impacting upon the unique resource area. However, all oil prone tracts, if not determined to be high hazardous to the environment, are placed in this category for primarily two reasons: (a) all are capable of spilling oil; the effects of an oil spill on open ocean marine biota is also considered adverse although not as severe as the effects on unique (usually nearshore or onshore) high value resources; (b) no clean-up and containment equipment can be effectuated during adverse weather conditions, such as violent storms and hurricanes and none of this type of equipment available today is very effective in five-foot or more seas. All tracts in this proposed sale, with the exception of the 35 tracts tentatively identified as highly hazardous, are considered to be moderately hazardous to the environment. This is due to the fact that at this time, prior to an established history of drilling activities in the area needed to identify oil or gas fields, all tracts in this proposed sale are considered capable of producing oil and gas. Therefore, none can be identified, at this time, as minimally hazardous even though there is a possibility that some of these tracts may prove to be gas producing only. For specific tract-by-tract characteristics see the appended matrix tables and the preceding section title "Recapitulation of the Matrices".

3. Minimal Hazard Potential to the Environment

Minimally hazardous may be defined as a gas prone tract whose development under existing operating orders, regulations and safety requirements promises a low level of disruption and adverse effects to the environment. Experience indicates that the impacts resulting from development of tracts of this type are not so much ecological in nature as they are conflictual with other uses or activities in a marine area. In most cases, such conflicts or hazards can be mitigated by enforcement of existing regulations or by attaching special conditions or

stipulations to the lease concerning its development.

None of the tracts in this proposed sale are considered to be minimally hazardous to the environment because none of them are defined as a gas prone tract only.

ATTACHMENT J

MATRIX APPENDIX

MATRIX APPENDIX

The following contains a presentation of a matrix table for each individual tract proposed for offering in this sale. The following code will appear at the top of each matrix table and should be translated in accordance with the following.

1	2	3	4	5

1. Leasing Area
   - M = Mobile
   - MS = Mobile South No. 1
   - PS = Pensacola South No. 1
   - AS = Apalachicola South
   - TS = Tarpon Springs
   - T = Tampa
2. Tract Number
3. Approximate statute miles from block to shore or nearest island
4. Approximate water depth of block in feet
5. Estimated type of production

   O = Oil G = Gas O & G = Oil and Gas

In addition the following legend will explain the letter headings for columns within each matrix table:

IM = Importance
PR = Proximity
F(ST) = Impact Factor - Structures
F(OS) = Impact Factor - Oil Spills

ANALYSIS OF POSSIBLE ADVERSE ENVIRONMENTAL IMPACT

M | 1 | 15 | 70 | O&G

SIGNIFICANT RESOURCE FACTORS	IMPACT FACTORS					
	Structures			Oil Spills (1000 bbl+)		
	IM	PR	F(ST)	IM	PR	F(OS)
Natural Resource Systems:						
Refuges/Management Areas	20	0.0	0	100	0.5	50
Unique & Highly Productive Areas	20	0.0	0	100	0.1	10
Biota Seaward of Estuary/Marsh/Nursery Areas	0	1.0	0	40	1.0	40
Beaches	40	0.0	0	80	0.5	40
Coastal Activities/Multiple Uses:						
Shipping	80	0.4	32	20	1.0	20
Outdoor Recreation	40	0.0	0	80	0.5	40
Commercial Fishing	80	1.0	80	80	1.0	80
Sport Fishing	0	1.0	0	80	1.0	80
Ordnance Disposal Area	100	0.0	0	0	0.0	0

M | 2 | 15 | 70 | O&G

SIGNIFICANT RESOURCE FACTORS	IMPACT FACTORS					
	Structures			Oil Spills (1000 bbl+)		
	IM	PR	F(ST)	IM	PR	F(OS)
Natural Resource Systems:						
Refuges/Management Areas	20	0.0	0	100	0.5	50
Unique & Highly Productive Areas	20	0.0	0	100	0.1	10
Biota Seaward of Estuary/Marsh/Nursery Areas	0	1.0	0	40	1.0	40
Beaches	40	0.0	0	80	0.5	40
Coastal Activities/Multiple Uses:						
Shipping	80	1.0	80	20	1.0	20
Outdoor Recreation	40	0.0	0	80	0.5	40
Commercial Fishing	80	1.0	80	80	1.0	80
Sport Fishing	0	1.0	0	80	1.0	80
Ordnance Disposal Area	100	0.0	0	0	0.0	0

M | 3 | 16 | 70 | O&G

SIGNIFICANT RESOURCE FACTORS	IMPACT FACTORS					
	Structures			Oil Spills (1000 bbl+)		
	IM	PR	F(ST)	IM	PR	F(OS)
Natural Resource Systems:						
Refuges/Management Areas	20	0.0	0	100	0.5	50
Unique & Highly Productive Areas	20	0.0	0	100	0.1	10
Biota Seaward of Estuary/Marsh/Nursery Areas	0	1.0	0	40	1.0	40
Beaches	40	0.0	0	80	0.5	40
Coastal Activities/Multiple Uses:						
Shipping	80	1.0	80*	20	1.0	20
Outdoor Recreation	40	0.0	0	80	0.5	40
Commercial Fishing	80	1.0	80	80	1.0	80
Sport Fishing	0	1.0	0	80	1.0	80
Ordnance Disposal Area	100	0.0	0	0	0.0	0

M | 4 | 17 | 70 | O&G

SIGNIFICANT RESOURCE FACTORS	IMPACT FACTORS					
	Structures			Oil Spills (1000 bbl+)		
	IM	PR	F(ST)	IM	PR	F(OS)
Natural Resource Systems:						
Refuges/Management Areas	20	0.0	0	100	0.4	40
Unique & Highly Productive Areas	20	0.0	0	100	0.1	10
Biota Seaward of Estuary/Marsh/Nursery Areas	0	1.0	0	40	1.0	40
Beaches	40	0.0	0	80	0.4	32
Coastal Activities/Multiple Uses:						
Shipping	80	1.0	80	20	1.0	20
Outdoor Recreation	40	0.0	0	80	0.4	32
Commercial Fishing	80	1.0	80	80	1.0	80
Sport Fishing	0	1.0	0	80	1.0	80
Ordnance Disposal Area	100	0.0	0	0	0.0	0

* Tract is partially within two shipping lanes.

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In accordance with letter from DAEN-RDC, DAEN-ASI dated 22 July 1977, Subject: Facsimile Catalog Cards for Laboratory Technical Publications, a facsimile catalog card in Library of Congress MARC format is reproduced below.

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